January/February 2006 >> Vol.23

AEC MAGAZINE

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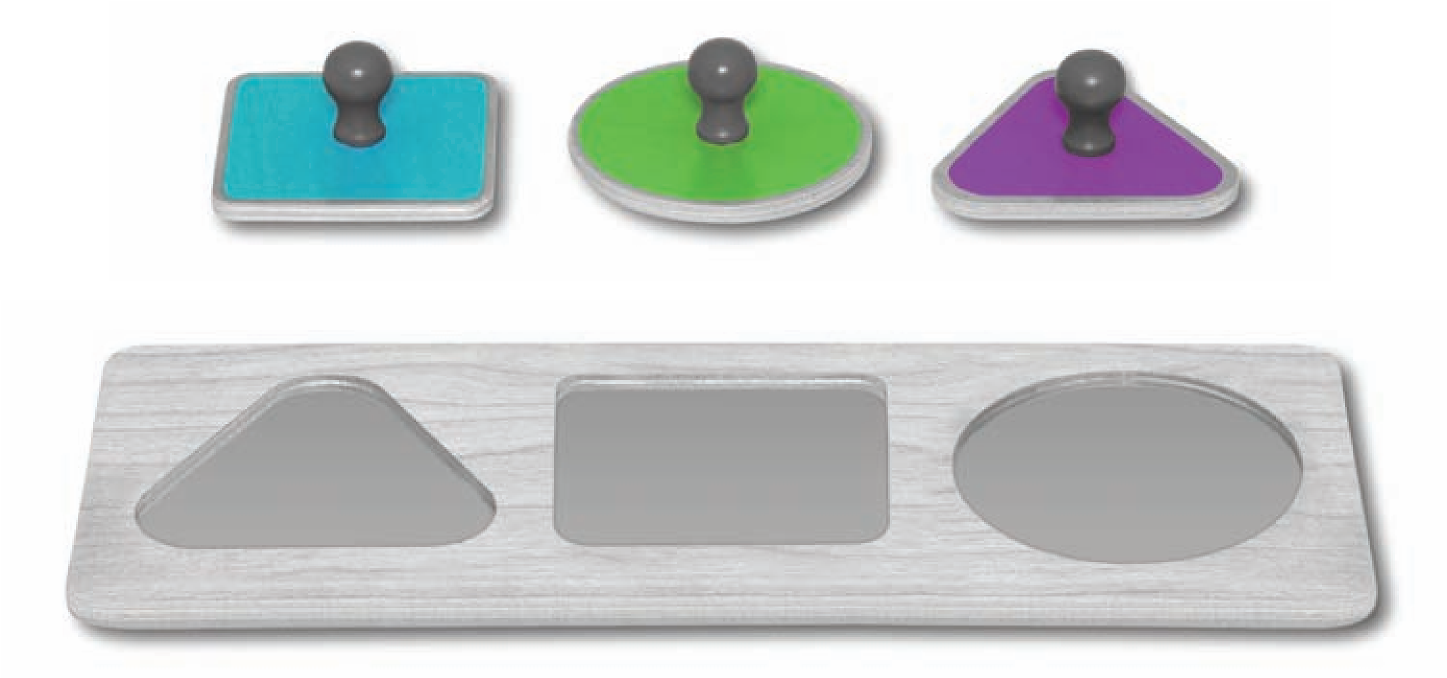
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MCAD - January 2006

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AEC MAGAZINE
DESIGN, MANAGEMENT & COLLABORATION IN THE BUILT ENVIRONMENT

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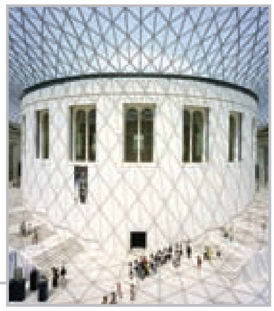
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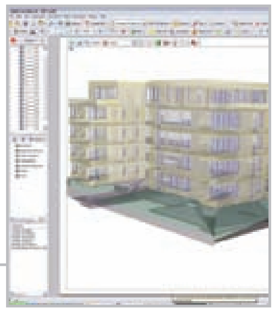
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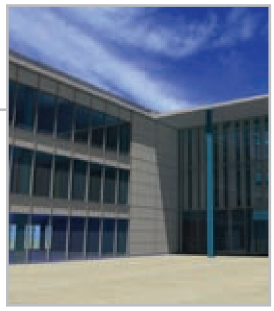
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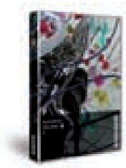
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AutoCAD LT 2006 Essentials	2 Days	£375
Architectural Desktop 2006 Essentials	3 Days	£695
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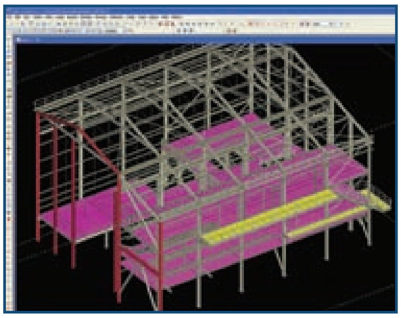




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Graphisoft looks to structures



Graphisoft's 3D building design solution ArchiCAD, can now seamlessly link to one of the leading structural design solutions, Tekla Structures. This import-export link means that design elements can be carried directly into Tekla for structural design tasks such as analysis and detailing, and returned to ArchiCAD retaining their critical parameters.

"To give our customers dramatic process improvement, we are better integrating the workflow between architecture, structural design and fabrication," said Bence Kovacs, Vice President of ArchiCAD Product Management from Graphisoft. "This unique ArchiCAD capability means that the same Virtual Building model can be used from the earliest sketches through to the CNC machine for production of building elements, using the appropriate software solution for every phase."

"This integration and round-trip exchange of data will enable both disciplines to minimise human errors and to save time by avoiding double-modelling the building," added Risto Räty, Executive Vice President and head of Building & Construction business area of Tekla.

www.graphisoft.com / www.tekla.com

Capita Symonds adopts integrated CSC solution

UK consulting engineers, Capita Symonds Structures, has integrated CSC's Fastrak Building Designer and 3D+ software, and used it successfully in the design and drafting process of Salford's XQ7, a 14 storey residential development with integral basement car parking.

"The steel composite frame was initially drawn within 3D+ and then passed to the Engineer for design by Fastrak Building Designer," explains Andy James, Capita's Project Engineer. "On completion the design was sent back to the 3D+ environment where GAs and sectional details were produced.

"This process provided a dimensionally accurate design model and an efficient frame resulted. An added benefit of the 3D model is that more precise column loads are calculated, which has resulted in a cost-effective foundation solution.

"To good effect we have also used the ability of 3D+ to track design development changes. This has allowed more effective and accurate reporting to the client, helping with budgetary control. Finally when mated with NavisWorks the 3D model provides an excellent visualisation tool for the whole team."

www.cscworld.com

Autodesk buys into bid and risk management

This month Autodesk reached into its pockets and found $46 million in cash to acquire Constructware, a provider of on-demand communication and collaboration solutions that are designed to streamline design, construction and facility project management.

Expected to close next month the acquisition will enable Autodesk to expand its collaborative project management solution, Autodesk Buzzsaw, with Constructware's cost, bid and risk management capabilities.

www.autodesk.com / www.constructware.com

AutoCAD integration for CAFM Explorer

The latest version of the facilities management software CAFM Explorer was launched in the UK last month - with new extended AutoCAD capabilities. Designed to make life simpler for the user, the new product, produced by Sussex-based FM software company FMx Limited, includes a dockable AutoCAD palette. For the first time users will be able to operate a two-way link to integrate their property details in CAFM Explorer with AutoCAD. The new customised tool eliminates the need for users to run two applications side by side - now any modifications made in AutoCAD will be automatically updated in CAFM Explorer's database.

CAFMCAD allows people in an organisation to keep track of their furniture and assets, whilst the system automatically tracks the status of all occupied, unoccupied and 'on the move' workspace. Departmental space can be easily identified for space planning and recharging purposes and automatically calculated and rolled up to any level of the property portfolio in CAFM Explorer.

www.cafmexplorer.com

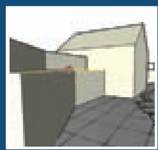
Intergraph acquires Alias



Spatial Information Management (SIM) software specialist, Intergraph, has acquired Alias, a global provider of piping design automation software. Alias provides piping software automation solutions to Intergraph and other vendors of 3D design software. Alias's flagship product, ISOGEN, provides automatic piping isometric drawing generation capability to the majority of 3D plant design and shipbuilding software users. Terms of the transaction were not disclosed.

www.alias.ltd.uk / www.intergraph.com

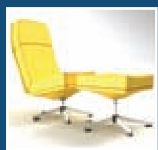
SketchUp for VectorWorks



Nemetschek NA has announced the release of a free SketchUp plug-in for VectorWorks. The plug-in enables users to import conceptual models created in SketchUp into VectorWorks for more detailed CAD work. Architectural models are able to be imported as wall, roof face, and floor geometry and SketchUp components are also mapped to VectorWorks intelligent building objects.

www.nemetschek.net/sketchup

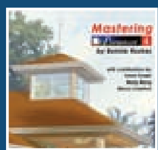
Contemporary 3D models



DOSCH 3D: Modern Furniture contains 100 very detailed and fully textured 3D-models of various modern furniture and electronics products. The completely textured 3D-models, which can be used to add exclusive elements to architectural visualisations and interior designs, are provided in multiple file formats. These include 3DS, 3ds Max (v5 and above), Lightwave (v6 and above), Maya (v5 and above), OBJ, VRML and Cinema 4D (v7 and above).

www.doschdesign.com

Mastering Piranesi book



Informatix Software has announced the release of Mastering Piranesi Version 4, a tutorial guide to all of Piranesi's tools, features, and effects. Piranesi is a 3D painting application which enables designers to take simple models and renderings, and quickly fill in details and create hand-drawn, non-photorealistic effects. The book is available from Piranesi resellers and online at ***www.f1help.biz/ccp51***

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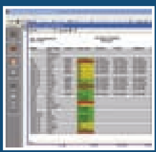
www.aecmag.com

'Hand-drawn' with Squiggle



Second Source has announced Squiggle 6.0, a new version of the software tool that enables architects and designers to give presentations, brochures, and other promotional materials a 'hand drawn' style. Squiggle works by reading the CAD file and allowing the user to vary the width and/or colour of each of up to 255 lines/pens and applying an unlimited number of styles, such as shaky, fuzzy, and wavy, to each line. Squiggle 6.0 retails for £149. ***www.secondsourceuk.com***

Buzzsaw takes to the road



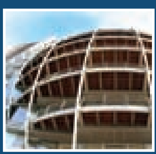
A joint venture between construction companies Clonmel Enterprises and Laing O'Rourke (CELOR-JV) has chosen Autodesk's Buzzsaw online collaborative project management solution to play a key role in a €125 million design and build contract near Dublin in the Irish Republic. This move is helping ensure that the N7 Naas Road Widening and Interchanges Scheme remains on track for completion within its strict 79-week timeline. ***www.autodesk.co.uk/buzzsaw***

Free VectorWorks viewer



Nemetschek North America has released a free, downloadable VectorWorks Viewer application that has been updated for VectorWorks 12. The Viewer enables those who do not own the program to view and print projects created in VectorWorks Fundamentals, VectorWorks Architect, VectorWorks Landmark, VectorWorks Spotlight, VectorWorks Machine Design, and VectorWorks Designer. ***www.nemetschek.net***

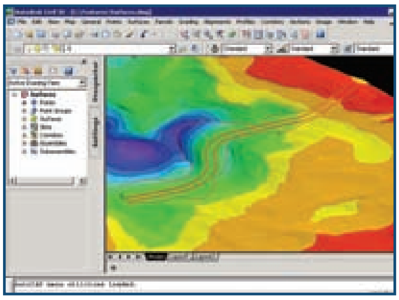
CSC updates calculation pad



CSC has updated it TEDDS calculation pad software, which includes a library of engineering proformas to increase the productivity of everyday structural calculations. Version 9 contains a significant number of new library calculations from snow loading to enhanced retaining wall analysis/design. Additional calculations for steel, timber and concrete are included, together with new seismic, pile cap, wind loading, raft foundation and RC thermal crack width checks. ***www.cscworld.com***

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Severn Trent adopts Civil 3D



Severn Trent Water is looking to improve design productivity by adopting Autodesk Civil 3D software for Civil Engineering design supported by consultancy, training and services from Excitech.

Having previously utilised both Shroer Medusa, Autodesk AutoCAD and AutoCAD LT, Severn Trent Water is now utilising Autodesk Civil 3D 2006 to enhance its civil engineering projects. An initial purchase of 45 licenses has been made along with the latest version of Integer SuperCAD for Re-inforced Concrete Detailing and PDS from Elstree Computing for Vehicle Path Analysis.

"Having looked at a variety of alternatives, Severn Trent chose Civil 3D as it has the best fit for their business needs. Its sophisticated object based design technology, functionality for 3D ground modelling and the need to manage facilities underground make it ideal," says Leigh Atkinson, Excitech's corporate account manager for Severn Trent.

As part of the solution, Excitech has conducted bespoke training courses to over 120 Severn Trent employees, including specific training where necessary in SuperCAD and PDS to aid the transition to the new platform.

Training has been selected by the delegates themselves using Excitech's Tailored Training Programme system which allows each individual to select the bespoke courses, venues and dates via a custom web interface. ***www.excitech.co.uk***

Next3D brings HiCAD and HELiOS to UK market

UK CAD specialist, NEXT3D has announced the availability of ISD's HiCAD and HELiOS in the UK. HiCAD neXt is a suite of CAD software solutions for Steel Construction, Mechanical Engineering, Sheet Metal and Plant Design, with an integrated HELiOS neXt Product Data Management solution.

HiCAD utilises the latest ESM-Kernel, and features what is described by its developers as a unique Information & Communications Navigator (ICN), innovative 2D/3D single file working environment and numerous automation tools.

HELiOS, a PDM solution, is fully integrated with HiCAD neXt and can also be integrated with all of the leading CAD/CAE/PLM solutions. Founded in 1977 and headquartered in Dortmund, Germany, ISD Software has in excess of 70,000 CAD/CAM and EDM/PDM users worldwide. ***www.next3d.co.uk***

3dcom delivers new vision for construction

3dcom is a new architectural 3D visualisation company within the Saltaire based Robinson Design Group. It provides computer generated images, photomontages and animations for the building and design sector and has been working with the Hull Immersive Visualisation Environment (HIVE) to apply this latest technology. HIVE is a new dedicated research centre based at The University of Hull in the department of Computer Science

Clients will be able to get a totally new experience of "walking round" a building, or homebuyers able to get a real feel of being within a show house or apartment by wearing the 3D glasses. This new visualisation system can be viewed either on a large workwall, for a group experience, or on a more compact, portable version measuring only 3 sqm. ***www.3dcom.co.uk***

AEC Software unveils FastTrack Schedule 9

AEC Software has started the shipment of FastTrack Schedule 9, the latest release of the company's flagship project management (PM) software, for both the Windows and Mac environments.

The ninth generation of the PM solution provides a redesigned interface and more direct integration with Microsoft Project and other leading PM solutions. In addition, new capabilities have been incorporated to make project planning and tracking simpler, including project consolidation and enhanced linking functionality, publishing projects as iCalendars, direct exporting to iCal and a larger library of pre-defined templates for a variety of project types.

"FastTrack Schedule 9 has all the project management functionality most businesses need and none of the clutter from features they simply don't," noted Dennis Bilowus, President and CEO of AEC Software. "Because it's intuitive and simpler to use than the bulky tools out there, everyone on your team will actually use it - and that's the only time project management can be successful."

FastTrack Schedule enables users to plan projects, present plans with colourful timelines, track performance, and share project information. . ***www.aecsoftware.com / www.unlimited.com***

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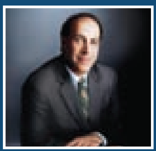
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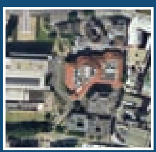
Autodesk has delivered a new extension to its 3ds Max subscription customers. Pro Booleans, based on Power Booleans from NPower Software, is ideal for building detailed inorganic shapes such as vehicles or mechanical objects. Other powerful aspects of Boolean modelling include creating detailed, accurate surfaces with minimal numbers of polygons - at high-speed performance. ***www.autodesk.co.uk***

Bass named Autodesk CEO



Autodesk has announced that Carl Bass, the company's chief operating officer, has been named president and chief executive officer, effective May 1, 2006. Bass also has been appointed to the company's expanded Board of Directors, effective immediately. Carol Bartz, who has served as CEO since April 1992, will become the company's first Executive Chairman of the Board. ***www.autodesk.co.uk***

Council wins for Getmapping



Getmapping.com, a leading supplier of aerial photography, has secured a series of major contracts from county and district councils to capture their areas from the sky. With a total of nine new contracts agreed since October 2005, Getmapping will be providing information-rich images to councils that include Gloucestershire, Stroud and the Cotswolds, South Oxfordshire, West Lancashire, Bedfordshire, Huntingdonshire, East Sussex and Alnwick. The new wins will kick-start the 2006 aerial survey programme and add to the 40,000 square kilometres of digital data captured in 2005. ***www.getmapping.com***

Colour flatbed scanner



Colourgen has announced the immediate UK availability of the new Designer 18 wide format colour scanner from Vidar. This latest addition to Vidar's comprehensive range is an 18" by 24" colour flatbed scanner, designed to scan all types of originals, including rare and valuable documents. The recommended retail price is £6,250. ***www.colourgen.com***

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Colourgen expands LED family



Colourgen has announced the exclusive UK distribution of the new range of wide format Teriostar LED printers and printer/scanners from Seiko I Infotech. The monochrome Teriostar range consists of the LP-1010 (printer only) and LP-1010 MF (printer/scanner). Both models offer a print speed of 3.4 A0 size prints per minute (600dpi) to a maximum length of 10 metres. They also feature a two-roll drawer system which supports multiple sized rolls. Users can choose between the automatic drawer selector or sheet feed to load media.

The LP-1010 MF has a built in CIS scanner with a true optical resolution of 600dpi, which can be adjusted to three different user settings (200dpi, 400dpi and 600dpi). Equipped with a large easy to use display, users can sort, collate, scan-to-file then print, copy and scale images (from 25% to 400% with retained quality) directly from the control panel. ***www.colourgen.com***

Colortrac announces SmartLF Cx scan range

Large format scanning specialist, Colortrac has announced the latest addition to its extensive range of scanners - SmartLF Cx40. This CIS array 600 dpi optical colour and monochrome scanner follows on from the SmartLF 4080 providing fast high-quality scanning for technical document applications including archiving, copying and digital distribution.

From the outside the SmartLF Cx40 looks very similar to the compact, lightweight 4080. However, under the skin things are very different with new features including a 600 dpi optical resolution, 48-bit colour data capture and an advanced, 2+4 all-wheel-drive 'Active Paper Transport' (APT) system. Colortrac has also adopted the dynamic normalisation application (DNA) used in its high-end CCD colour scanners that, combined with the 48-bit data sampling, are designed to improve the shadow and highlight details of images and provide better tone recognition.

The SmartLF Cx40m monochrome model starts at £4,495 and the top of the range colour express model is £5,625. ***www.allied-images.com***

ATI introduces next generation mobile graphics

ATI has introduced its next generation mobile workstation technology with the Mobility FireGL V5200, available in the Lenovo ThinkPad T60p. The Mobility FireGL V5200 features 256MB of memory, 12 pixel shader processors and five vertex shader units to drive complex models and assemblies.

"By providing outstanding graphics capabilities in both desktop and mobile workstations, end users no longer have to make sacrifices when it comes to the system selections - they can choose the solution that meets the requirements of their business and their need for mobility," said Dinesh Sharma, Director, Workstation Products, ATI. "The Mobility FireGL V5200 combines ATI's leading expertise in mobile technologies, including power management, performance and image quality with our extensive knowledge in the workstation market to give 3D professionals a compelling mobile workstation solution with the Lenovo ThinkPad T60p."

Lenovo was formed as a result of the acquisition by the Lenovo Group of the IBM Personal Computing Division last year. ***www.ati.com / www.lenovo.com***

Wacom raises bar on interactive tablets

The Cintiq 21UX is the latest graphics tablet from Wacom, aimed at industrial and automotive designers and architects for working directly on a screen with a pressure sensitive pen.

Replacing the Cintiq 18SX, the new model combines a larger 21.3 inch flat screen with high UXGA resolution, a stylish and ergonomic design and now incorporates full Intuos3 functionality, which is designed to enhance efficiency and productivity. With this range of new features, the price of the Cintiq 21UX stays the same as its predecessor at £1,899. ***www.wacom.com***







The new HP Designjet 70 Printer series with HP Inks and Media is the perfect A2+ system to help deliver all the important details of your jobs – from text and line drawings to full colour renders and visualisations. Just imagine in-house printing that saves you time and money – all from a printer that's fast and reliable enough for you to be able to leave the roll-feed option in charge of printing whilst you concentrate on creating. Its A2+ format also means it's ideal for print previews and specific part-prints of overall jobs. For more information go to www.designjet.hp.com

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Technology as the translator

Pete Baxter, Northern European sales director, Autodesk Building Solutions Division, looks at the ways 3D CAD images can be used beyond the design department and how they can significantly enhance customer service.

Pete Baxter



I recently heard a story about a small Chinese company working on global projects. As the team didn't speak much English, they were asked how they communicated with their international partners. "This is our language, now," they said, pointing at 3D models of their designs on their computer screens.

With the rise of the electronic transfer of data via email or over the internet, the increase in the number of pan-global projects and the growing acceptance of building information modelling, cultural and language barriers become irrelevant. In 3D design software, at last we have technologies that earn their living by improving productivity and helping to create, manage and share.

They say that seeing is believing and it is true that being able to visualise the end building as an integral part of the design process is a huge benefit. It can help communicate ideas to customers eager for a glimpse of what they are getting for their money and to planners keen to assess how a building will sit in a particular landscape.

But of course the important thing about 3D design is that it produces not a picture, but a model holding all relevant information within it. So we are not only sharing images, however powerful these may be, but valuable, accurate data held on a single building model.

Design information is now our lingua franca

For example, the large worldwide practice Wimberley Allison Tong & Goo (WATG) has recently adopted this way of working. The team creates a single, integrated building information model and then shares this information with clients and team members across the world. "I have 600 – 700 users throughout the world, working on close to 70 projects," Jim Grady, WATG CAD manager, told us.

The multidisciplinary firm RTKL has done a similar thing: "It has changed the dynamics of the project team," says Heidi Stemkoski, a RTKL designer. "People aren't so isolated working on just plans, sections or elevations. It's just not possible to work that way anymore. The team understand the building as a whole – and that's better for the project."

But maybe it is the client – whether this is the building end user or property owner – that we ought to consider first. There will always be a place for high-end visualisation and animation to communicate an intended end result. There is no doubt that the stunning and realistic images these produce have the "wow factor" that can help sell a major development or similar heavyweight project.

However, architects must carefully consider the degree of realism actually needed. When you produce a sketch nobody expects the finished building to look just the same. However, when you show a photorealistic image, clients can regard this as a statement of intent, which can set expectations as to how the final scheme will actually look even though many design decisions have yet to be made.

What is needed is a practical compromise; a rendered model that can be used day to day as a design tool, especially if you want to show changes and work "on the fly" while sitting with a customer.

Consequently, the latest 3D software gives visualisation and rendering tools back to the architect so visualisation no longer has to be a drawn-out specialist task but a relatively quick and available process.

As David Davison, UK CAD manager at RTKL explains: "Visualisations are now much easier because, as the building model is being developed, we are able to generate a rendered perspective from the same design file. Therefore, when the client wants to view the finished development, it's a simple process."

This works well for smaller practices too. The London-based firm Brunton Boobyer was under increasing pressure to provide such visualisations to customers and had tried several 3D solutions. However, it found that using these there was still the need to produce a separate set of drawings running parallel with standard 2D information. This made the production of illustrations time-consuming and expensive.

However, director, Simon Boobyer, solved this by using a solution where a 3D rendered model is created as an integral part of the design process. Instead of having one visualisation set in time, they can now generate a realistic and understandable model at any stage of the process.

Lancashire architectural practice Croft Goode uses the same solution for all RIBA Plan of Work Stages A to L. This allows them to actually design alongside clients and building users from the outset. "This enables all involved to see and understand the spaces and relationships between building elements clearly," says John Bridge, architectural technician.

Both these firms have discovered that a rendered 3D model helps smooth the path with the planners and even credit it with helping them get plans passed quicker. One of Brunton Boobyer's projects was a single-storey house of contemporary design situated in a conservation area.

"On paper this would have set alarm bells ringing for the planners," says Boobyer. "But we could show exactly how the property would look and fit into its immediate surroundings."

Chris Tweddle of father and son firm Tweddle Associates tells a similar story: "The planning authority had originally refused a £1 million barn conversion because they believed

> "Brunton Boobyer and Croft Goode have discovered that a rendered 3D model helps smooth the path with the planners and even credit it with helping them get plans passed quicker"

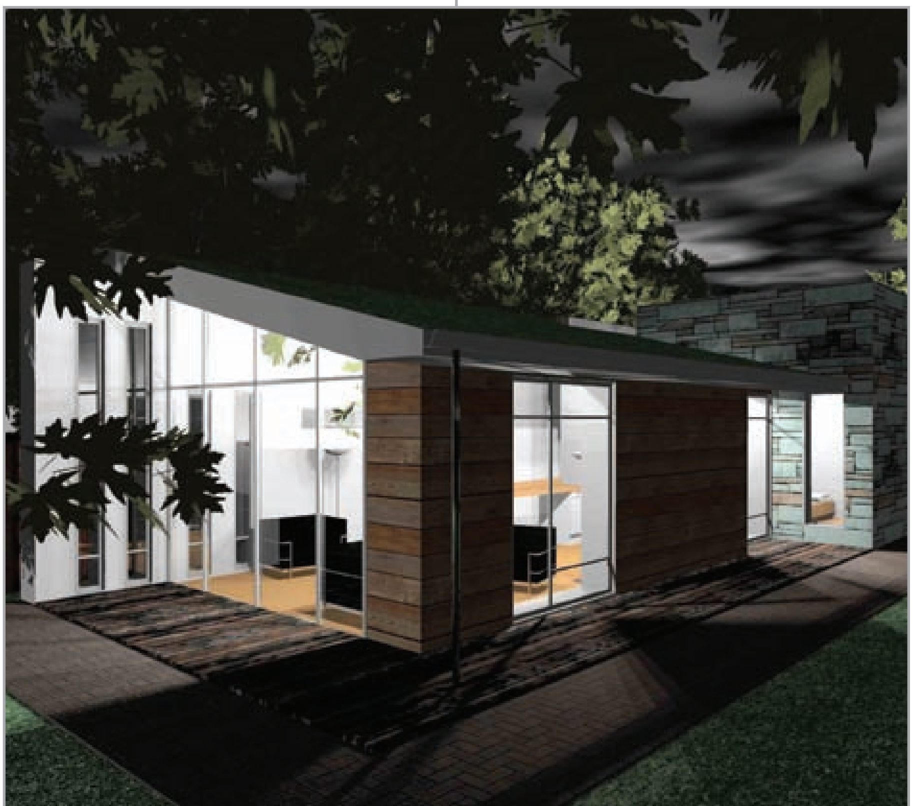


<< Multidisciplinary firm RTKL believes that the use of a single, integrated building information model has enabled the project team to better understand the building as a whole.



For the design of this housing project London-based Brunton Boobyer wanted to get away from the local developer-led traditional style but as it was in a conservation area, alarm bells started ringing. However, because they could see what it looked like, the planners were sympathetic.





it would spoil the neighbouring properties' view.

"By providing an accurate image of the respective elevations of the proposed conversion and adjacent properties we were able to show that this was not the case. Planners respond positively and it speeds up the process of consents significantly." He recalls that in this particular case the faster completion not only meant that Tweddle got paid quicker – it also meant that the houses sold at the top of the market.

Sales and marketing teams have reacted favourably to 3D models too. The images are readily available to use in Powerpoints, brochures and to illustrate tender documents, providing a cost-effective alternative to photography.

> "Through graphical visualisation, architects and building services engineers can reference each other's designs to ensure co-ordination and minimise conflicts between disciplines"

Better coordination between disciplines

All these advantages certainly improve communication and customer relationships – but perhaps the main gains in productivity come where the technology helps to translate the architect's ideas to other designers and engineers further along the line. Through graphical visualisation, architects and building services engineers can reference each other's designs to ensure co-ordination and minimise conflicts between disciplines.

For example, Autodesk Revit Building users can quickly change their architectural design to provide accurate background information for the engineers using Autodesk Building Systems and vice versa. Autodesk Revit Structure, released in the UK in early 2006, will further improve communication in the multidisciplinary design team by extending to structural engineers.

To see how this is working, we need to move to what is probably the most high-profile building project in the world at the moment – the Freedom Tower in New York. Here, JB&B, the project's building services engineers first worked with Autodesk Consulting to use Revit to develop generic building systems modelling content. This has improved co-ordination with all disciplines as work is carried out in 3D on a plasma screen in the architects' (Skidmore Owings & Merrill) conference room!

CSG, the structural engineer, used Revit and AutoCAD to model the tower's foundations and existing buttress slabs, core walls and columns on the original design. The firm is now implementing Revit Structure for use on the design and construction documentation of the new design concept. Once again this is helping translate ideas between the different professionals on the project.

Each discipline within the AEC industry has been a bit like the British themselves; proud of the idiosyncrasies of their own language and reluctant to try to communicate in any other way. But the pressure to increase profit margins means we can no longer afford this luxury.

A central building model can lead to closer communication, greater understanding and enhanced co-ordination. Which means better buildings and increased success – in any language. ***www.autodesk.co.uk***

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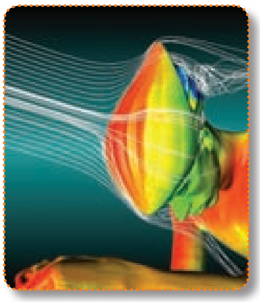
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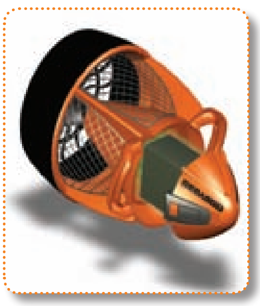
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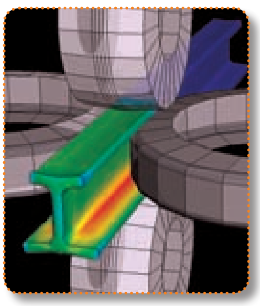
Incorporating SM Solid Modelling +prototype

product development 2006

Product development from concept to production









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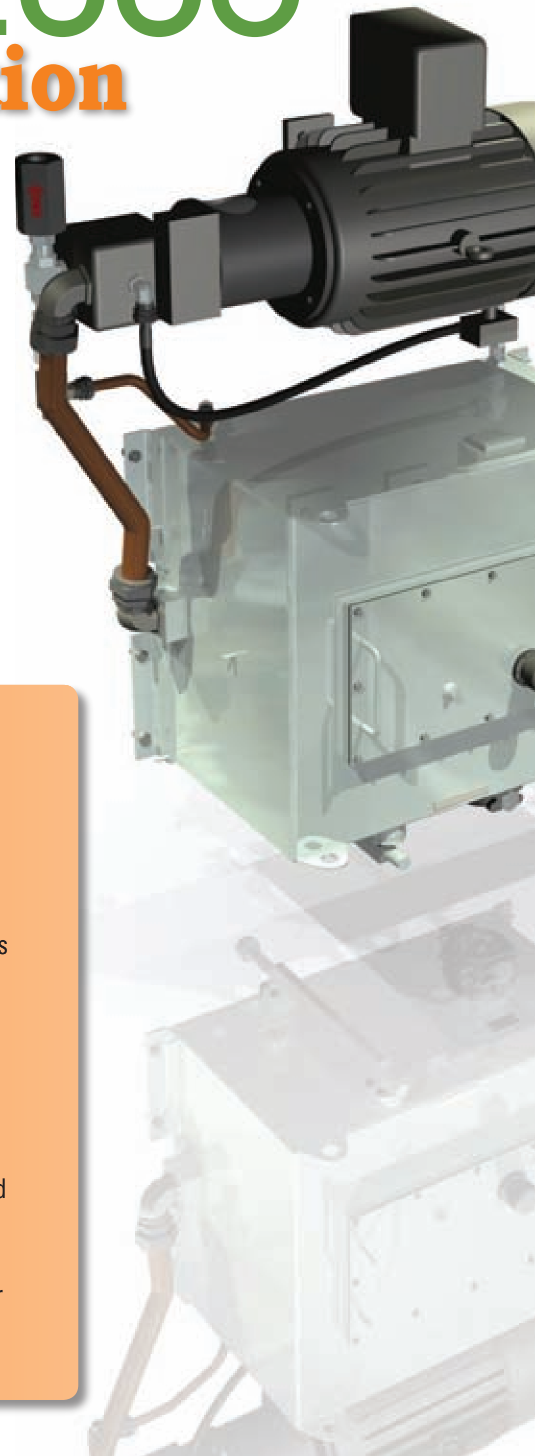
Product Development 2006 is proud to take place alongside Mach, Subcon and several other vertical market events for industrial engineers. **EDA Exhibitions** will work with the other organisers to create a seamless experience for attendees to maximise the productivity of their visit. Joint marketing efforts will give exhibitors the greatest amount of visibility and contact within the various target groups.

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Visitors will also be able to take advantage of open technology demonstrations and user contact areas will focus on enabling technologies for designers and engineers. Likely areas of interest are expected to be compute-intensive design and novel applications for emerging uses of design technologies. Innovations and success stories illustrated in a live format will create a strong visual impact and a higher degree of interactivity for show attendees.

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The smart revolution: part 1

This month's Cambridge-based workshop and conference, held at the British Museum in London, demonstrated that the momentum behind the Smart Geometry group continues to grow.

Martyn Day

According to the CAD software companies, industry analysts and even the press, CAD usage can be pretty much divided into 2D and 3D; you either use one, the other, or a bit of both. Despite what the CAD vendors would like everyone to think, most companies still rely heavily on 2D, because CAD software's primary deployment has been that of a 'drawing board replacement'. 3D usage is quickly growing in the Mechanical CAD space but in the construction industry 3D is still only found in the realms of specialist designer, perhaps within the practice of a 'Signature Architect', a structural analyst or a 3D visualisation expert.

When one thinks about 3D design, the natural assumption is that the 3D model would be a virtual model of the finished building, complete in detail but static. Just as 2D plans are the blueprint of a design's plan, elevation and section. This view comes from the common understanding of 'what CAD does for us' and how it's applied merely as a documentation tool.

There's a growing number of AEC companies that use their CAD tools differently, and are researching new applications, processes and group working to use 3D in a different way. The challenge is to use the computer and the software to enhance the design part of the process, to easily produce/control complex geometry parametrically and provide a framework for design exploration. It's not good enough to build a static 3D model as these have to be rebuilt if there are any changes. If we are to see the benefit of 3D, the models have to be able to change and adapt. The embodiment of this movement seems to be centred on the SmartGeometry group.

Smart thinking

Initially recruited mainly from within London's elite architecture and structural firms, the group is dedicated to educating the construction professions in the new skills which will be required to use these new 3D systems effectively. The SmartGeometry Group's founding members include Lars Hesselgren (KPF), Hugh Whitehead (Foster and Partners), J Parrish (Arup Sport) and Dr. Robert Aish (Bentley). To a certain extent, it would be possible to construe that the group is mainly concerned with promoting Generative Components, a technology that Robert Aish, Bentley's Director of Research, has built on Bentley's MicroStation CAD platform, but it's clear from the presentations given at their events that the platform isn't the key issue, it's the approach to using computers in an explorative design context that is the common link.

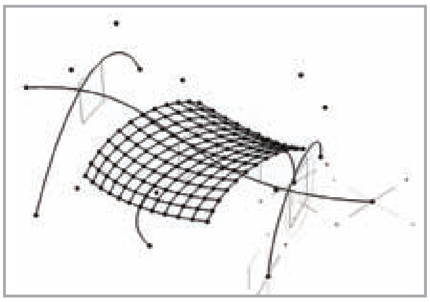
However, the key reason for the group's existence is to offer a selection of AEC students access to Generative Components (which is still in development), and develop a programmatic solutions to design issues they are interested in. The 'students' can come from education institutions or from within practices. The SmartGeometry's conferences offer a mix of thought-leader presentations, interspersed with demonstrations of what the students managed to achieve with Generative Components in the workshop sessions.

From successive SmartGeometry events it's clear to see that the concept for more powerful design tools is growing in the community. As to what's driving this interest, I talked with a number of attendees at February's SmartGeometry event held at London's British Museum. It seems there is growing interest in designing more complex forms, driven by practices like Foster and Partners with the Swiss Re building. The only way to do this is to use computer technology to assist in the design, test and manufacture. It's a simple tale of competition driving the technology through the industry. If you want to compete you need to be at the leading edge.

> "New technology is needed and a fresh approach to using CAD within the design and manufacture process has to be found"

Practices told me they were establishing Research and Development teams to look at the technologies and their possible impact on their design capability. On this subject, I remember talking with Frank Ghery on his use of Dassault Systemes' Catia to realise his designs. He quipped, "Using Catia I can make a wavey wall for the same price as a straight wall. So why make a straight wall?"

To produce affordable yet impressive designs in the today's architectural vernacular (or tomorrow's!), the traditional appli-



›› Fig. 1 3D Surface Model

cation of 2D and a static 3D model simply fail. New technology is needed and a fresh approach to using CAD within the design and manufacture process has to be found.

While many architects may not see the need to move to 3D, those that have, including those in attendance at the SmartGeometry sessions, seem 'liberated' in their attitude towards their use of forms. While the tools do require considerable technical knowledge to drive them, the 'art' and aesthetic element of architecture can come to the fore, with the computer handling the complexity and perhaps making the design viable by automating the panelisation, or automatically calculating the optimum number of structural elements.

Aish explains, "With the advent of digitally controlled fabrication, the 'geometrically aware' and 'computationally enabled' designer is now as close to the materialisation as in the original craft process, but with precision and control and the ability to explore variation which was previously unimaginable."

Generative Components

Generative Components is being used and evaluated by key industry players like Foster and Partners, Morphosis,

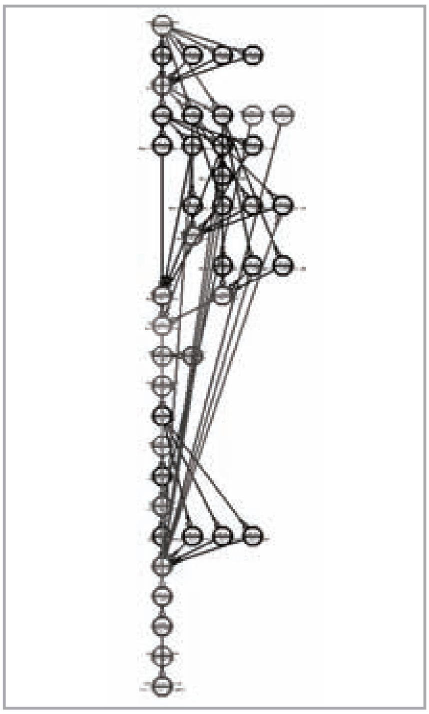


Fig.2 Symbolic model

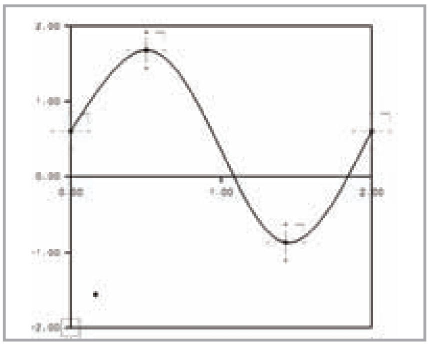
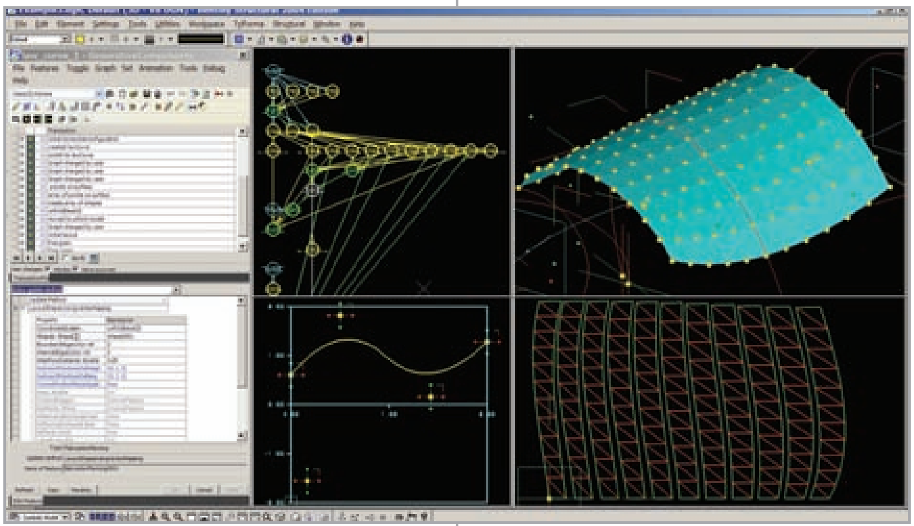


Fig. 3 Law Curve Model



KPF, Grimshaw, NBBJ and ONL, as well as a number of Schools of Architecture, including the Architectural Association, MIT, Georgia Tech. and the Technical University of Delft. The technology is about to go into beta and will be commercially available on MicroStation at some point in the future.

The system has been created on three themes: Geometry, Composition and Algorithmic thought. In terms of geometry, all the usual primitive elements are used-points, planes, coordinate systems, line arc, curves, surfaces and solids. Then there are geometric operations which are applied to the geometry, such as projection, intersection, union, difference and transformation. Using these operations, Generative Components can create simple and complex relationships between base geometry to allow modification, or configuration. Aish relates this to building a 'control rig', building geometry which may never be seen but may indirectly control the subsequent geometry created in the design process. Essentially the real time manipulation of these control points allows variation within the design.

In terms of composition, Aish explains, "It is pretty rare to find a building which is a realised as a single discrete object. Normally we are considering assemblies of components which, at intermediate levels of aggregation, form identifiable sub-systems. While these components may be pre-defined, or the subsystems may follow established industry conventions, there are increasing opportunities for each design to use mass customisation and digital fabrication to define project specific components. There is a tremendous advantage in using computational design tools which directly support the idea of 'composition' and which allow these strategies to be developed and tested."

On algorithmic thought, this concept is based on the need for the system to be able to calculate, based on the intention of the designer. This could be calculating a façade, automatically placing structural elements or applying a transformation equation to a surface. To do this the designer has to have explicit knowledge of how to drive the system. This is probably the most difficult hurdle to overcome with Generative Components, as the designer really needs to be part programmer and programming requires a logical approach to problem solving.

It appears that many of the firms that have used or evaluated Generative Components have opted to have a dedicated team to build these design rigs, based on the limits of the initial concepts. This allows the architects on the project to then interact with the rig, a live 3D model with embedded logic and quickly evaluate design alternatives. However, the team will only be able to operate on the control points that the original rig developing team deemed it necessary to create. Aish puts considerable emphasis on the time spent prior to building the rig, breaking down and anticipating the level of variation required further down the line. "We have to match our tools to the concepts around which designers want to build their skills," added Aish. "Our expectation is that geometric skills, compositional skills and algorithmic skills will be the key to future design."

To put that into layman's terms, Generative Components is a layer on top of MicroStation which provides a programmatic and visual way of building control geometry which can be used to interactively control a model. This isn't the 'walls, doors and windows' 'intelligence' of products like Architectural Desktop, which is essentially about quickly generating 2D general assemblies. Generative Components works at a much lower level and isn't bothered about the interaction of pre-defined recognisable building components. It simply concerns itself with geometry, complex relationships, control and applying complex, user-defined computations to a design.

Conclusion

In the next instalment I'll look at the presentations given at the February SmartGeometry event. The keynote was given by Chuck Hoberman, a talented artist and inventor whose designs for morphing and transformable objects has won him world acclaim. Hoberman has created everything from toys, furniture and art installations to military designs for tents and quickly deployable blast walls.

Also of note, Spencer de Grey, partner at Foster and Partners wrapped up the event with a presentation on the British Museum Great Court and Smithsonian roof projects, which he oversaw. Fosters use of expressive forms has, in part, helped drive this movement and was a fitting end to the proceedings. At the after conference drinks, we all stood underneath the undulating roof, as a practical reminder to all those who had attended. ***www.smartgeometry.com***

Information aggregation

Continuing his theme of mapping, James Cutler, CEO, eMapSite, looks at the use of bespoke web portals that allow multiple levels of access (management team, project team, client, suppliers, sub-consultants, quality team) to various project resources via a simple website.

You've been appointed, you've sourced your baseline information, you've collected digital geographic data about the site and its environs, the site investigation team has reported back, the design team (spread across three offices) is ready to go… but there's a problem… your existing project management tools/Intranet are not configured to allow all this data to be brought together and as project manager you now have to assimilate all the relevant information for each person involved. It's going to be a long night! But, you guessed it, there is hope.

Never happened to you? Well, you're either lucky and brilliant or work for one of the very few organisations that has sought, internally, to resolve this conundrum. If the former then our best wishes for continued good fortune and promotion and if the latter, for example Arup with ArupLink, then the services that are emerging to address this knowledge gap should still be of interest.

Web 2.0 / Social software / Collaborative Working

This is the year of Web 2.0 (apparently) when the implicit opportunities afforded by the "inter-web" become realisable by dint of easy-to-use, always-on, PAYU (or not at all) browser based applications that bring all of us and what we do closer together. Well that's what some parts of the over-excitable press corps are saying! More prosaically, it is a truism that the ubiquity of web access and Internet based communications facilitate peer-to-peer (P2P – think Napster or BitTorrent) data and information exchange and thus the possibility of greater wisdom through sharing (of documents, thoughts and most anything - instant messaging, VoIP telephony, texting, email, streaming etc).

The very strength of this platform (the highly democratic P2P) is fundamentally at odds with what project managers would deem to be coherent integrated operations. Quality assurance and management systems, commercially sensitive information, conformance, compliance, security and so on are the framework on which sound business and excellent implementation depends and these can be undermined by P2P systems without very strong protocols to authenticate and control these potentially disruptive tools and technologies.

Some organisations respond to this scenario with a restrictive approach to adoption. They and many others do, though, recognise that aligning business processes with what the inter-web makes possible is both an opportunity and a business and competitive necessity. As such the challenge they face is deciding on what path to adopt that meets their needs, especially when project documentation is so diverse and is required and used in different ways by different project stakeholders, some of whom may not even be in the business.

The predominant route adopted to date amongst those looking ahead has been the enhancement of corporate intranet offerings to include collaborative tools. Originally intended as internal tools, concerns arise (commercially and technically) when there is a requirement to either integrate external services or enable external access on a person, task or project related basis or both (being the most likely scenario).

Outsourcing, a dirty word?

Actually outsourcing is a concept that is entirely familiar to everyone within the AEC sector as it really is another word for sub-contracting! Outsourcing of services based on software is certainly a recent phenomenon but one that is gathering both speed and acceptance. For certain industries or roles there are collaborative tools available as web services "off the shelf"; for example, online CRM salesforce.com has been the darling of a new wave of technical stocks on the NYSE. However, such standard tools are not currently ideal in the project management and data exchange domain let alone targeted at the AEC sector.



This situation rather means that organisations seeking competitive advantage through performance enhancement and productivity tools seek out those who can both integrate seamlessly into the corporate intranet and at the same time provide a range of services and functionality that add real value or eliminate real costs. If these services are provided as part of an existing and essential toolset or service so much the better!

Service providers recognise the trade-off between paid-for "product" and the must-have functions that draw and retain their customers in the first instance. Google, Friends Reunited, AOL, various newspapers, Which? and many others provide a range of commercially successful examples of how this approach has entered mainstream online services (from the all for free to the all paid-for with plenty of "come-ons"/tempters/some now-more later to move from free/trial to paid-for models).

The online professional mapping arena provides more of a challenge owing to the complexity of the products and the functionality often associated with them. While the procurement interface provides benefits and operational advantages in its own right, project managers focus on "must-have" project management and information aggregation functions to help them avoid the scenario above.

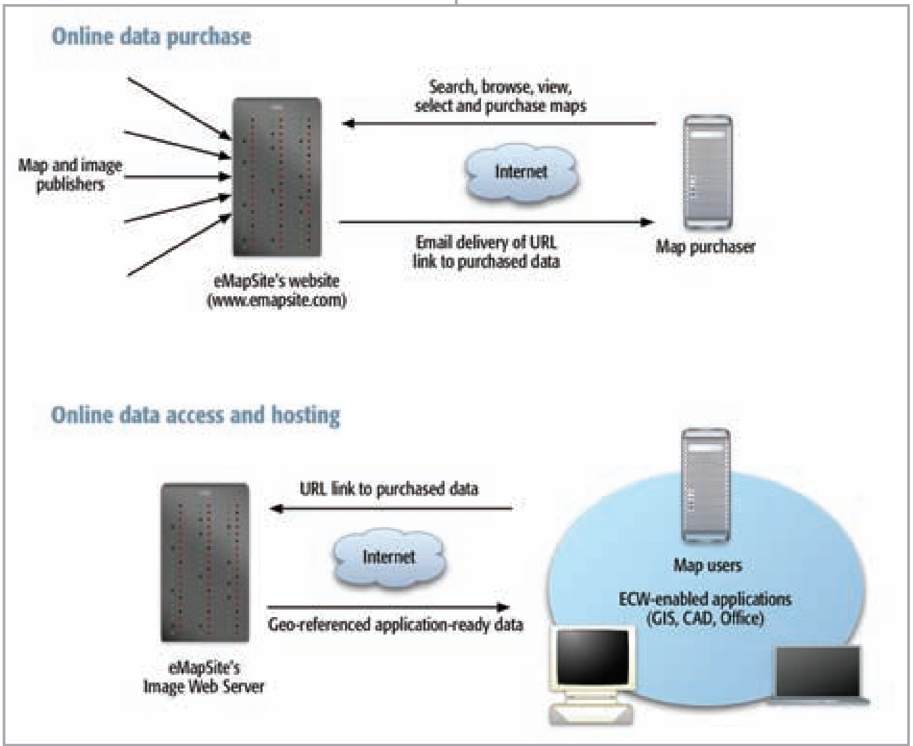
e-Project Site

These tools might reasonably be grouped under an "e-Project" banner and would represent a bespoke web portal that allows multiple levels of access (management team, project team, client, suppliers, sub-consultants, quality team) to various project resources via a simple website that provides different access rights and functionality associated with the login. Functionality might include:

- Search, access, and view geographic data online
- Access associated reports
- Download PDF versions of maps/reports
- View online mapping, switching on and off data layers as required
- Administrative access to upload vector (SHP files) /raster data (ECW) and update content
- Client connection via a secure login to associated project maps/data
- Universal access to project team to all project data resources i.e. sub-contractor or equivalent
- Online data management tools according to level of access e.g. buy new data, generate quotes, edit areas, manage project data, accounts, extend licensing etc
- Data extraction via polygon tool and download
- Geocoding of PDFs to a project location
- Translation of non-SHP files to SHP on upload to enable display
- End user licence agreement interface at point of purchase in order to appropriately license data on behalf of project/client when appropriate
- Search tools (implicit or explicit) that interrogate

project holdings for existing data in order to avoid duplicate purchase
- Option for multi-year licensing
- Spatial tools to display project locations, zoom in and display (raster) data (or possibly vector as well) and link to associated data (PDFs) for that project

Some of this functionality is already available on spatial web services gratis and it is anticipated that more will follow; however, as project managers and others become more au fait with what can be achieved and the benefits that can be derived it is likely that paid-for and/or custom functionality will appear. As with other markets costs reflect predicted additional server load and scalability, additional maintenance, risk etc. Modern security and user authentication tools (familiar to some from Microsoft's MapPoint) allow centrally billed transactional and other services to be internally assigned, an essential and powerful tool for overhead allocation purposes.



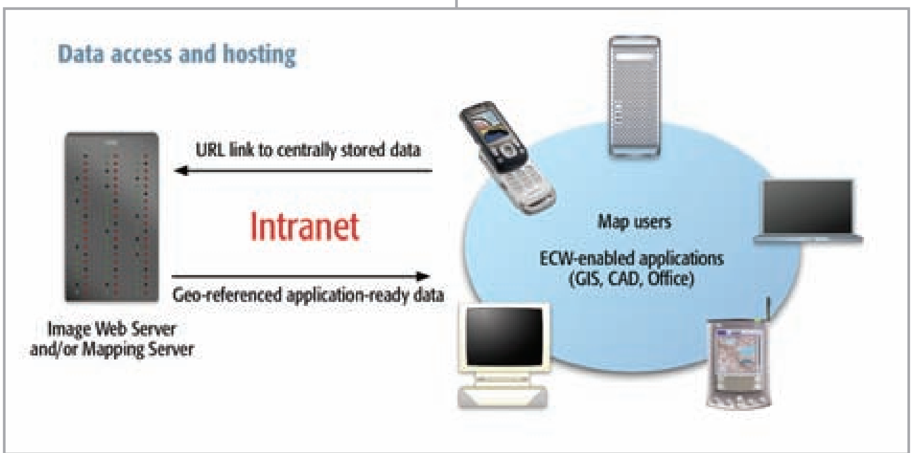
Headache to solve?

eMapSite has championed this type of service for the last few years and already has in place a standard range of collaborative tools as part of the standard customer interface. In addition eMapSite is pioneering the integration of a suite of spatial tools to enrich the interrogation and retrieval of project-specific information sources.

There are a number of mechanisms available to deliver such services

- Shrink-wrapped COTS or open source solution (which may not meet all the requirements but offers a quick win for key areas; examples include MapServer (not to be confused with Autodesk's open source offering of the same name), GeoServer, cadcorp SIS Web, MapInfo MapXtreme or ESRI ArcIMS)
- Customised COTS solution (if available)
- Internally developed solution based on COTS platform (using for example GeoConcept Information Server or ArcIMS)
- Platform independent web service based solution

Web services deliver on a customer's specific requirements i.e. you only get (and pay for, if at all) what you need; eMapSite develops web services that are used as components in any specific service. This makes for relatively light-weight web applications that are quick to develop and easy to deploy. These can be as open or as closed as required by the customer in terms of retrieving, manipulating, displaying and outputting data.



A web service based solution can be independent of licensing fees, maintenance, staff recruitment and training, hardware investment etc and is ultimately a very flexible toolkit that can be further developed and refined in line with the changing demands and expectations of users.

The major benefit of designing something specific to your requirements is that it is exactly that. There are COTS options but these can carry risks in the form of single vendor dependency and all the ongoing costs of training, maintenance, updates etc that this incurs. You could also be committing to a significant initial outlay in investment perhaps before you have obtained corporate buy-in to the concept. The major advantage of our web services is their scalability and initial low cost of investment that allows you to build a service to meet your ongoing requirements and roll this out as corporate momentum grows and investment is made available.

This article was written by James Cutler, CEO at eMapSite, a platinum partner of Ordnance Survey and online mapping service to professional users

www.emapsite.com

Acrobat 3D

Adobe has been showing increasing interest in being a key player in the design distribution and technical publications market. The company has just got very serious about 3D CAD.

Martyn Day

Product: Acrobat 3D **Supplier:** Adobe **Price:** £825

From talking with Adobe folks over the years, you get the feeling they are totally amazed at how popular PDF is in all design fields. This feeling of amazement is probably because Adobe never really concentrated on providing specific design functionality within the format. With Acrobat Version 6 and 7, the company started to cater more to the design market and enhanced its 2D and 3D capability, together with mark-up/review style features.

However, when Adobe 'did' 3D it wanted to have an 'open' format and plumped for Intel's U3D definition. Unfortunately all the CAD vendors bar one, Bentley Systems, went off and developed their own lightweight publishing format, leaving U3D only useful to Bentley customers, or people who purchased additional conversion tools to get their data into U3D. Unfortunately we know you are on a hiding to nothing by trying to get a consensus or agreement on a single format in this industry. There's a lot of talk of openness and collaboration but this is rarely delivered on outside of a company's product set.

At the end of January, Adobe came back to readdress the thorny issue of 3D with the launch of Acrobat 3D and the Adobe 3D reader. From what I have seen, it's pretty clear Adobe understood what it had to do to rectify the format problem and has produced something way above my expectations. Acrobat 3D isn't just a tool to get 3D data into PDF format, it's a complete 3D authoring environment for designers and a great tool for creators of technical documents and publications.

Over a year ago, Adobe purchased a French company called OKYZ which had some clever 3D graphics capturing technology. Adobe has used this technology in Acrobat 3D and the company has also done a licensing deal with Right Hemisphere to provide a broad range of CAD file conversion libraries. So, with these two tools embedded in the product, there are actually three ways to get a 3D model into Acrobat 3D.

The first and easiest is to drag the 3D model into an active Acrobat 3D session. The second is a simple right click on the file and selecting the 'PDF conversion' option. The third is using the OKYZ clever 3D capture technology which grabs the OpenGL 3D display list of any application and converts it to a PDF. However this will only work when your display is set to use OpenGL. If the application does not support an OpenGL display, you will have to use one of the other two ways of getting 3D in to Acrobat 3D. Also in some cases the OpenGL grabber will capture tools and navigation elements that may be part of the CAD interface, as they may be OpenGL elements. As a result, it's best to try and minimise their presence while grabbing.

I understand Adobe is working on an ActiveX version of this capture technology and this is probably a good idea as we see OpenGL as being marginalised as the CAD platforms move towards Microsoft Vista, which may only offer limited OpenGL support. Autodesk Inventor is one product we definitely know will be supporting Direct X, Microsoft's alternative 3D graphics library.

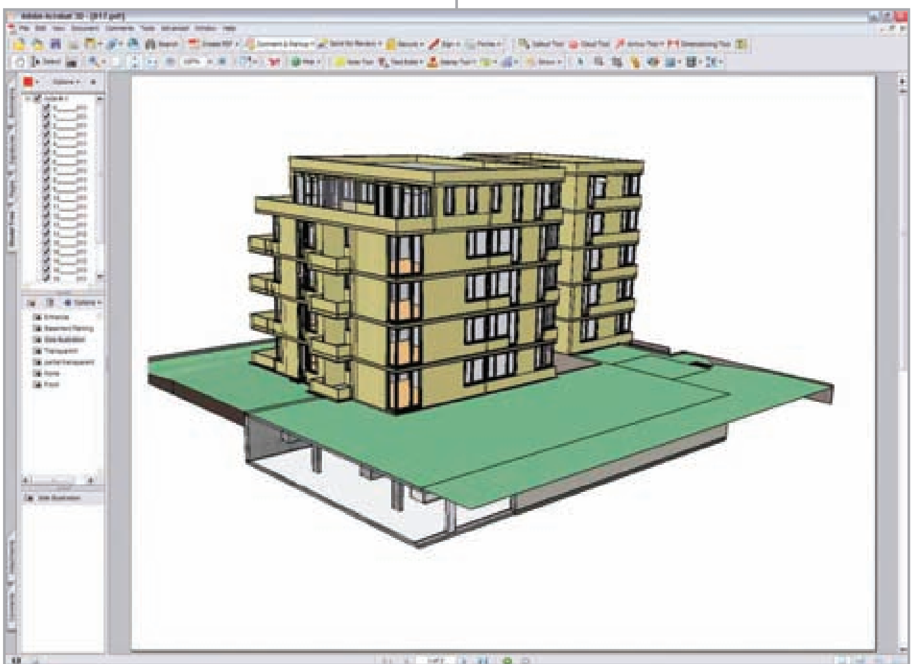
Adobe provides an extensive list of engineering applications that it has tested, including Autodesk Inventor, 3ds Max, AutoCAD, Catia, Maya, Pro/Engineer, MicroStation, Solid Edge, SolidWorks, Unigraphics, I-deas, ICEM Surf, Revit, Abaqus and Rhino. Of course, it's also possible to include 'standard' 2D documents in the file, like spreadsheets, Word documents etc.

System requirements

- Pentium 4 or better processor
- 512MB RAM or more
- 1GB available hard drive space.

Acrobat 3D runs on Windows 2000 SP2/XP. For best results, Adobe recommends video hardware acceleration with DirectX 8.1 or higher and an Nvidia or ATI card with Pixel Shaders suppport.
There is currently no support for the Apple Macintosh.

> All the building blocks are now in place for Adobe to really offer a solution for the management and distribution of engineering content at the file level.



Talking of Microsoft Office, it's now possible to take Adobe-converted 3D data and insert that into Excel, Word and PowerPoint. With PowerPoint a whole presentation could be one 3D slide, or a number of PowerPoint slides, looking at various details or exploded elements of a design - less a presentation, more a live design review tool. Microsoft Office docs, which contain 3D could, in-turn, be also made into PDF files. As part of the conversion process, the 3D data is 'thinned out' so the files are significantly smaller than the originals.

So moving on from last year's release of Acrobat 7, which had very few ways to get 3D data into PDF, Acrobat 3D offers data import every which way you want it. It's no longer possible to complain that Adobe has left this part of the jigsaw puzzle unfinished. You want your 3D data in PDF? You got it.

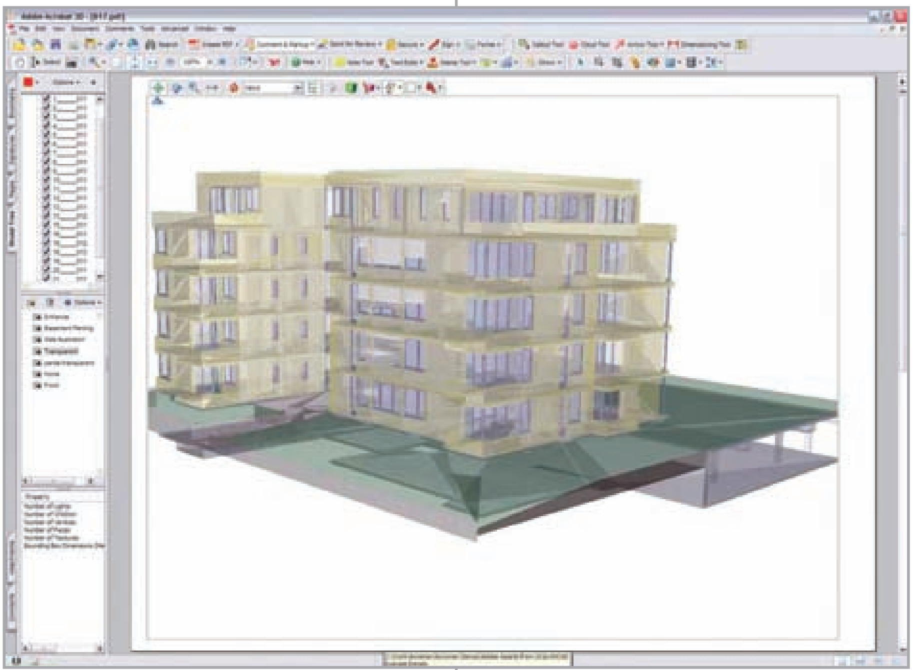
Authoring

So once you have this 3D data in Acrobat 3D what can you do with it? Well, with this product, Adobe has gone

way beyond my expectations as to what it would deliver. Acrobat 3D solves the CAD import issue and then provides a complete 3D toolkit to manipulate and enhance the 3D model for intelligent use within the PDF file. The user can create animations, change lighting, alter textures, even select the best 3D view and turn it into a shaded 2D vector image for placement within the document.

For Technical Publications applications this is really fantastic. Acrobat 3D gives control capabilities to manipulate the original 3D CAD file to take 'snap shots' for technical docs, or technical docs can have a whole new twist and include live 3D models, with bill of materials and predefined animations. Imagine emailing a field engineer a PDF with instructions on how to take something apart, with an animated model embedded, showing the exact sequence of how it should be taken apart. There's nothing more explicit than moving graphics. This is very cool stuff.

As you would perhaps expect, Acrobat 3D also provides the features found in Acrobat 7 Professional, including the ability to bundle multiple documents into a



> Acrobat 3D isn't just a tool to get 3D data into PDF, it's a complete authoring environment for designers and a great tool for creators of technical documents and publications.

single PDF file, markup tools that can be activated for use by those viewing the document in the free Adobe Reader, e-mail review tools, and security features. that limit recipients' ability to view, print and edit the file. Cross-section and measurement tools are also provided, although at the data is tessellated, any measurement is good but approximate.

Conclusion

With Acrobat 3D, Adobe answered its critics, of which I was one, that perhaps it didn't really understand the MCAD market, especially when it came to 3D, formats and the CAD vendors inability to agree common standards. The product takes Adobe into some very interesting territory and from what I can tell, most of the other CAD developers now don't see Adobe's move as a threat, quite the opposite. Many have told me that Acrobat 3D and Adobe's developments are complimentary technology to what they are doing.

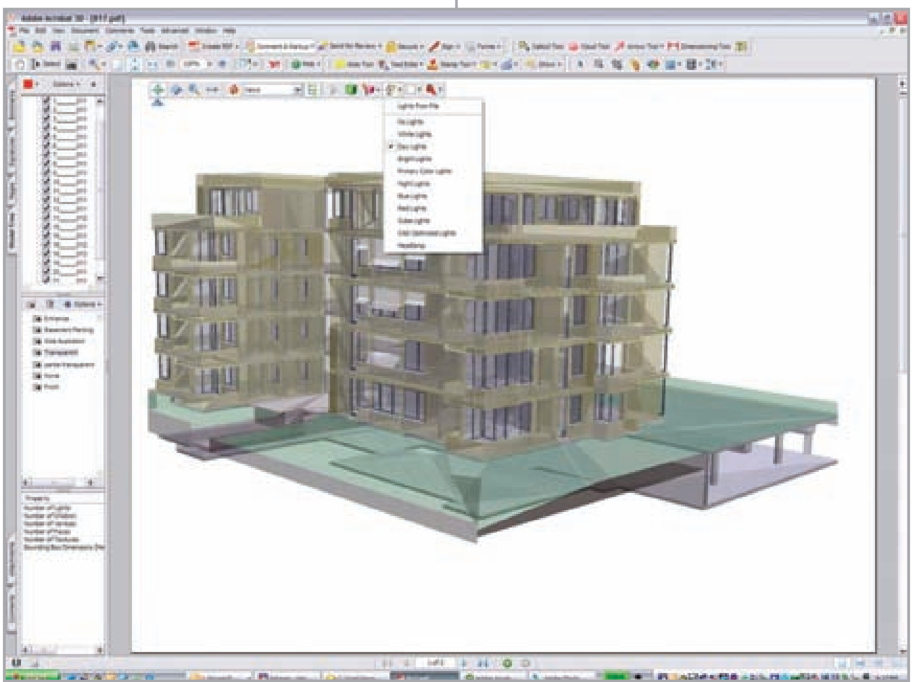
It seems that while the CAD vendors are all happy to carry on developing their own 'open' publishing formats (JT, DWF, 3DXML, eDrawings etc.) they recognise that Adobe and 3D PDF technology will also allow 3D to get a wider audience and some, like PTC, have already embraced the new functionality and plan to use it in their product suites (in PTC's case, Arbortext).

All of a sudden, Adobe is in the technical publications market, although to an extent it has been in document publishing with Framemaker. Acrobat 3D is a necessary to tool to do the combine 3D content, 2D content, text information and bill of materials spread sheets, to produce extremely rich engineering content. The delivery wrapper for all this is PDF, which of course is ubiquitous, so anyone can read it.

Adobe's other efforts in document security, namely Policy Server, also come into play here. So you can have complete control over who sees your rich 3D PDFs, when they can access them, where they can open them and for how long they remain active - even outside of a document management system. All the building blocks are now in place for Adobe to really offer a solution for the management and distribution of engineering content at the file level.

At the moment I think users are not demanding 3D in their documents but over time as this technology becomes more widely used, I have a strong feeling that nearly all technical publications are going to have some element of 3D in them. There is no easier way to understand a product or an assembly than to actually have the model in front of you; 2D plans will always require a bit of lateral thinking. By delving so deeply into 3D and developing such a rich feature set, Adobe has really brought PDF content to life. I think Acrobat 3D is going to be a big seller.

www.adobe.com



Visualisation for architects

With the use of VIZ Render and a few extra minutes of work on your Architectural Desktop model, anyone can produce a fairly good rendered image says CADline's Technical Services Manager, Justin Taylor.

Justin Taylor

Visualisation, the creation of photorealistic images and animations, is often seen as a 'Dark Art' and those individuals that create them the 'High Priests' of the CAD world.

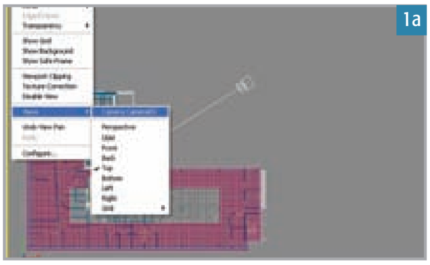
This is true to a certain extent, as creating really high quality photo realistic images requires an in-depth knowledge of various parameters such as a material's 'Index of Refraction' or its 'Luminance cd/m2', or whether a scene requires the radiosity calculation to 'Regather the Indirect Illumination' etc. This is not something that every CAD user needs to know, wishes to know or indeed has time to learn and it's often the case that a practice either has a couple of people trained up in the use of high-end visualisation packages, or that they outsource their requirement to a 3rd party bureau.

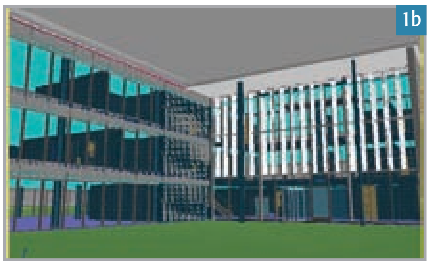
Often, whilst a project is being developed, certain visuals are required for presentations, reviewing etc. These visuals generally do not need to be the absolute pinnacle of photo realism and are required fairly quickly.

Now without upsetting any of the visualisation gods out there, their time is best spent producing the very high end work and anyway, they are often too busy to knock up a quick low end perspective render for every user requiring one.

This is where VIZ Render comes in. Autodesk has integrated an advanced visualisation tool derived from VIZ 2006 with ADT, and the product has been optimised and streamlined for use by architects. The results that can be achieved with a few extra minutes work on top of the ADT model can be very good and often meet the immediate requirement, without the necessity of waiting for the practice's visualisation guru or the bureau to get back to you.

So the question is: How easy is it to create a fairly decent rendered image and how long will it take?


1a


1b

Working with VIZ Render

Well let's start by looking at the ADT model. Within ADT it is possible to have all the design objects pre-set with materials i.e. windows will have a frame made from either wood or metal etc and the glass from, well glass obviously (although this could be coloured, tinted, mirrored etc.)

So when a practice sets up its Object Catalogue with the main design components, these render materials will automatically be applied as the model is created. Therefore little or no additional time is required to do this within VIZ Render. (It is possible to create and apply materials within VIZ Render.)

Within ADT click on the Open drawing menu arrow at the bottom left of the screen and choose Link to VIZ Render. This will open VIZ Render and create an active link with the original model in ADT. Any changes made to the model in ADT can be immediately updated in VIZ Render by reloading the link.

VIZ Render can utilise any cameras that have been placed within ADT. To do this 'right mouse click' on the viewport name (top right) and select Views > Camera. Then repeat, this time selecting the Smooth + Highlights option. This will display a shaded perspective view of your model. See Figures 1a and 1b. Without carrying out any additional work, click on the render icon (the little teapot button) on the render toolbar. This will render the viewport as the model currently stands.

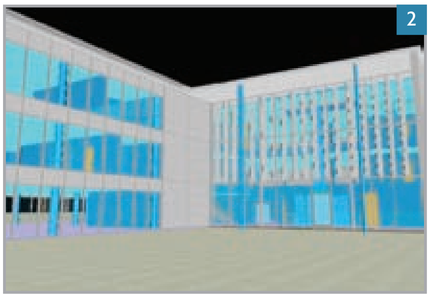
The resulting image, as seen in Figure 2, is pretty poor. The scene looks flat with no real lighting, shadows, reflections, sky etc. The materials from ADT have come across however.

So how can we improve this image simply and quickly? Firstly let's add a background. Select Environment from the Rendering pulldown menu. This opens the Render Scene dialogue box. Under the Environment tab within the Background parameters, click on the Environment Maps button (set to none initially). This will allow you to browse and select an image to use as a background.

Next, to give the finished scene a sense of true lighting, depth and shadows etc. place a Daylight System. Set the viewport to top down view and select Daylight system from the Create pulldown menu. Click and Drag to place the compass and set the orientation of the sun.

The Daylight system is designed to follow the geographical angle and movement of the sun over the earth at a given location. You can set the location, date, time and compass orientation from the modification palette. These features can also be animated allowing sun studies etc. Switch back to the camera perspective view and render the scene again.

The resulting image, as seen in Figure 3, will now have a background and the model will be illuminated with a true representation of the sunlight casting shadows. This is already a much improved image, but the lighting is still not quite correct. In the real world that we live in, light bounces back from surfaces, bleeding colour, and is reflected and refracted by shiny materials etc. This is where your practice's visualisation guru will spend much of his/her time tweaking the renders settings to improve the final results. However the idea of VIZ Render is that the average ADT user can produce good results without this time consuming and complex process.


2


3


4

Select Render from the Rendering pulldown menu. This will open the full Render dialogue box. In the Render Options at the bottom of the dialogue box, select High-Exterior from the Preset options and click the Load button in the Select Preset Categories dialogue box. Now render the scene once more.

This time the resulting render will take longer to produce as VIZ Render is now calculating the light in a true sense and bouncing it back from all the surfaces etc. This gives the scene a much more polished and accurate look e.g. the shadows are not pitch black and the undersides of the eaves are illuminated etc. See Figure 4.

Conclusion

So with the use of VIZ Render and a few extra minutes work on the ADT model, anyone can produce a fairly good rendered image. If better results are required, then the .RTF file that VIZ Render produces can be opened in either full VIZ or MAX and further developed.

wwww.cadline.co.uk

Océ wide format showcase

Océ recently unveiled a new range of high-productivity wide format print, copy and scan systems. AEC Magazine's Consulting Editor, John Marchant reports from the launch event, held at Océ's headquarters in Venlo, The Netherlands.

John Marchant

Those of you old enough to remember the colour pen plotters of old will understand exactly why the majority of engineering drawings are still produced in monochrome. Fortunately, things have changed for the better. The latest generation of wide format colour plotters and scan/plot/print stations are now within the reach of all sizes of organisations and HP, KIP, Ricoh, Kyocera, Canon, Xerox and others are fighting hard for that business. This competition can only benefit you, the user. It is against this background that Océ has launched a new range of high-productivity wide format print, copy and scan systems. From what I saw at Océ's 12th January new product launch, they will give the competition a run for their money.

Fastest colour plotter?

Pride-of-place went to the TCS500 wide format colour printing, copying and scanning system. This is claimed to have the fastest and most productive colour CAD plotter in the world. The TCS500 is capable of printing an A0 CAD line drawing in monochrome in only 40 seconds or printing it in colour in only 60 seconds. The system looks particularly useful in Geographical Information Systems (GIS) applications as GIS data files are often complex to process and can exceed 100MB in file size. The TCS500 achieves its high speed in part through the company's Dynamic Switching Technology. DST detects the type of file being printed and adjusts the settings to optimise speed and quality and will even adjust the settings for different areas of the document during printing. The use of nine print heads – three monochrome and two for each colour – further assists the printer attain such a high speed. Targeted at small to medium AEC companies - around 100 staff and 10 CAD seats – the TCS500 will ship to UK customers by March.

Entry-level printing

The entry-level CS2044 (44" width) and CS2024 (24" width) should be of particular interest to small manufacturing and AEC organisations producing up to 1,500 m2 of CAD drawings and colour graphics a year. This range is equipped with a standard Windows driver and there are two optional RIPs for HPGL and PostScript processing and a full PANTONE colour library. Pre-set Océ media profiles match the inks and media to the printer, saving the time and cost of test prints. I was particularly impressed by the speed of output and the readability of the drawings. Printing of architectural visualisations was good, too. Price details are to be confirmed but are expected to be in the £3,500 to £5,000 range. At this level, it may make sense to have this capability in house rather than outsourcing to the local copy shop.



The entry-level CS2044 is designed for those looking to produce 1,500 m2 of CAD drawings and colour graphics a year.



Oce's new entry level TDS320 mono scan/copy/print system, aimed at workgroups and smaller engineering firms.

Enhanced scan/copy/print

The TDS450 wide format mono scan /copy/print system includes Océ's own 600 dpi colour scanner. This device employs a new single mirror, single camera optical system together with Direct Scan technology for uniform, stable, sharp and accurate images in mono and colour. This is reckoned to eliminate the risk of image distortion or misalignment by reducing the number of moving parts to a minimum. In addition, Océ's Image Logic technology ensures accurate reproduction of all kinds of originals, both black and white and colour, whether multitone images like illustrations and photos or CAD drawings with fine line details. The TDS450 is available as standard as a black and white printing system, with the option to expand the system with a full-colour scan-to-file capability.

Entry-level scan/copy/print

Completing this round of new product announcements is the TDS320 mono scan/copy/print system. The system is aimed at workgroups in large companies and at smaller engineering and architectural firms that produce between 2,000 and 5,000 mono A0 plots a year. Océ claims its Radiant Fusing Technology ensures excellent reproduction of fine details, sharp lines, smooth curves and high-level grey scales. Switching between media sizes is made simple with automatic switching between the two media rolls and the integrated Compact Output Stacker streamlines the delivery of printed documents.

*John Marchant runs the SkilStream Partnership (**www.skilstream.com**)*

www.oce.com/uk

Workstation reviews

Despite the introduction of dual core processors from AMD and Intel, there is still a huge demand in the CAD sector for single processor machines, which offer plenty of power without breaking the bank.

Greg Corke

Scan 3XS

Virtually all AMD Opteron-based workstations on the market at the moment can carry two physical processors. And if you're talking about two dual core CPUs this gives you a quad processor machine on your desktop, with serious power for multithreaded applications.

While a machine with this level of multi-processor power will get visualisation and analysis specialists more than a little excited, the average CAD user, whose application is likely to be single threaded, isn't really going to know what to do with the additional processors. Yes, the ability to multitask, or run two applications concurrently, without a significant drop in performance is a major benefit, but if you're predominantly focussed on running a single CAD application, it's also a bit of a luxury.

With this in mind there continues be a huge demand for single processor workstations, but despite AMD treading on Intel's toes at the top end of the market, we've yet to see any Opteron workstations to rival the Pentium 4 in terms of price/performance - until now, that is.

Scan's latest 3XS workstation is that machine, a single processor Opteron workstation built around a single processor motherboard, but most importantly with a price tag of £1,225.

For this price, the Scan 3XS doesn't include the highest specification Opteron CPU there is, but the Opteron 148, which runs at 2.2GHz. Despite its mid-range positioning in AMD's Opteron family (AMD's top-end Opteron 154 runs at 2.8GHz), the processor is still able to deliver excellent performance under a cross section of CAD applications.

CPU and graphics aside, Scan has implemented 2GB DDR PC3200 memory, two striped (Raid 0) 250GB Samsung SpinPoint SATA300 hard drives, and an ASUS A8N-SLI motherboard. While this motherboard is primarily designed for AMD Athlon processors, it is able to accommodate the new socket 939 Opterons. In addition, the suffix denotes that it is SLI capable, so you can add another Quadro FX 1400 graphics card in the future



should you want to, which will very much depend on whether Nvidia solves the problems it's been having with SLI on Windowed OpenGL applications (see The Truth about SLI on ***www.aecmag.com*** for more on this).

Finally, it's also worth a mention that unlike a lot of Opteron machines we've seen, the 3XS was remarkably quiet throughout all of our testing, which is down to the highly capable cooling system that Scan has employed. This consists of three large parallel fans - one of which is an integral part of the CPU's heatsink and is perpendicular to the motherboard - which route air efficiently from the front to the rear of the machine.

In conclusion, the CAD sector has been crying out for a machine like this. The Opteron has finally been delivered in a single processor system giving CAD users access to all the power of AMD's CPU without having to pay a premium for a dual processor platform. This, coupled with Scan's excellent build quality, makes the 3XS workstation an extremely exciting proposition for the workstation market in 2006.

Specifications

- 2.2GHz AMD Opteron 148 (Socket 939)
- 2GB DDR PC3200 memory
- Nvidia Quadro FX1400 128MB graphics card
- 2 x 250GB Samsung SpinPoint SATA300 Hard drives (Raid 0)
- Asus A8N-SLI Premium Edition Mainboard
- NEC 4550 x16 Dual Layer DVD-Writer
- Windows XP Professional (SP2)
- £1,225

www.scan.co.uk

Dell Precision 380

A recent survey in our sister publication, MCAD, showed that 40% of CAD users are still using a desktop PC, rather than a dedicated workstation. In the survey we didn't ask the reasons behind this choice, but we guess that, on the whole, it all boils down to price. You can easily pick up a PC for under £600, but most workstations cost two, three, even four times this amount. So why is this? Obviously a lot of it comes down to specification, with top end processors, buckets of memory and high speed 3D graphics, but this 'additional' cost is also due to certification – an assurance that you will be fully supported on your chosen hardware and, in practical terms, the knowledge that your graphics card will display an exact representation of your design, or at least if any problems do occur that they will be looked into and rectified with new driver releases.



So what if you could buy a certified workstation for virtually the same price as a PC? Well, thanks to a new promotion between Dell and ATI, you can. Dell is currently offering one of its entry level Precision 380 workstations for a mere £599. For this you get a 3.0GHz Pentium 4 630, 1GB 533MHz DDR2 SDRAM, an entry-level ATI FireGL V3100 graphics card, an 80GB (7,200RPM) SATA drive, 48x CD-RW/DVD combo, media card reader and Gigabit Ethernet. Windows XP Professional (SP2) comes as standard and you also get a three year next day on site service.

So what's the catch? Well, as far as we can see there doesn't seem to be one. Yes, the specification is 'entry-level', and you're not going to get cutting edge performance, but this 'special' configuration of the Precision 380 still offers mid range CAD users a more than capable certified platform for CAD work, at prices never previously seen between the pages of AEC magazine.

Upgrades are also available and £60 will buy you an additional 1GB of memory, which we think is money well spent. There's also an upgrade path to an ATI FireGL V7100 graphics card for £400, but marrying this high-end card with a 3.0GHz Pentium 4 processor will probably mean the performance is mismatched for most users.

Specifications

- 3.0GHz Intel Pentium 4 630
- 1GB 533MHz DDR2 SDRAM
- ATI FireGL V3100 128MB graphics card
- 80GB SATA hard drive
- 48x CD-RW/DVD combo drive
- Multimedia card reader
- Windows XP Professional (SP2)
- £599

www.dell.co.uk

CAD2 IMAGINE FX3800-64 Workstation

Over the past few years CAD 2 has made a name for itself in the workstation sector by consistently providing extremely well constructed machines packed with quality components. The Imagine FX3800-64 is no exception and the first indication of this is the new CoolerMaster WaveMaster case, whose aluminium alloy construction gives the machine a solid reliable look and feel. Inside you'll find CAD 2's trademark Intel workstation motherboard (in this case the D955XBK), custom cabling, cable clips and sound and vibration insulation lining the inside of the case.

The Intel D9555XBK features all the standard workstation technologies including four Serial ATA interfaces with RAID support, a single PCI Express x16 slot, four DDR2 SDRAM DIMM sockets (with support up to 8GB) and room for a single Pentium 4, Pentium D or Pentium 4 Extreme Edition processor.

With single threaded applications still the mainstay of the CAD market, CAD 2 has chosen Intel's Pentium 4 670 3.80GHz, which is currently the fastest single core processor that Intel offers. This is likely to be the case for some time as Intel, like AMD, is putting its money into dual core (two chips on a single piece of silicon) for its future generation CPUs.

In terms of memory the Imagine FX3800-64 features 3GB DDR2 memory in 2 x 1GB DIMMs and 2 x 512MB. This might sounds like an odd configuration, but tallies with the physical limit imposed by 32-bit Windows XP Professional when the /3GB switch is invoked. The downside is that should you wish to move to Windows XP x64 Edition in the future and upgrade your memory, you'll have to strip out and replace the 512MB DIMMs.

CAD 2 has also configured its two Seagate Barracuda 7200.9 160GB S-ATA 300 hard drives in a novel way. One partition on its Raid 0 array has been formatted with the standard 4k cluster size (for standard data usage) while the other has been given 8k clusters (which is designed to accelerate the loading of large models). In practice we found a slight performance advantage when loading a large assembly in Autodesk's Inventor CAD product on the 8k cluster partition, but the assembly in question also referenced a number of small parts. It would be interesting to see the effect of loading a large single file on this partition, such as a single DWG in AutoCAD.



On test, the Imagine FX3800-64 gave a good account of itself across the board, particularly impressing under all of our 3D intensive application benchmarks.

In summary, with impressive build quality and good all round performance the CAD 2 Imagine FX3800-64 Workstation provides an excellent platform on which to run your CAD application. With all four memory DIMMs full and what looks like being the top end single core processor from Intel for some time, your hands are tied when it comes to upgrading. But with the Intel D9555XBK motherboard also able to run dual core processors and 2GB DIMMS, there's still flexibility for the future if you don't mind swapping out your components.

Specifications

- 3.80GHz Intel Pentium 4 670
- 3GB PC2-4200 533MHz Dual-Channel DDR-2
- Nvidia Quadro FX 1400 128MB graphics card
- 2x Seagate Barracuda 7200.9 160GB S-ATA 300 hard drives (Raid 0)
- Intel D955XBK Advanced Workstation Motherboard
- Pioneer 110D 16x Dual Layer +/- Multi-Format DVD ReWriter Drive
- Windows XP Professional (SP2)
- £1,595

www.cad2.com

Fujitsu Siemens Celsius V830

If we handed out prizes for size and sheer bulk, Fujitsu Siemens' Celsius V830 would win hands down. Its huge chassis is extremely solid in construction, and you get the feeling you could drop one of these industrial units onto concrete and it wouldn't complain too much (not that we're endorsing you do this, of course).

While there isn't always a direct correlation between size and computational performance, the V830 has all the trademark specifications of a serious high-end workstation. Typically, this is one that is built around two AMD Opteron processors, but to fit in with our requirement for single processor workstations this month the review machine only featured a single Opteron 252, which runs at 2.6GHz - but more on this later on.



If the Celsius doesn't get the attention of the whole office simply by getting it out of its box, it certainly will when you start it up. Like many Opteron machines, the V830 makes a substantial amount of noise at first, with all three fans running full whack, but things calm down once Windows has booted up. More importantly, the machine remained relatively quiet even when running our compute intensive CAD applications, which is great news for densely populated offices.

In terms of CPU performance the Celsius came out top in virtually all of our tests. However, despite sporting one of the fastest single core processors on offer, the Celsius is kitted out more conservatively in the graphics department, with a Quadro FX 540. While this card will be more than adequate for all 2D and most 3D CAD applications, some may find its performance lacking a little under more graphics intensive applications such as 3ds Max.

Out of all the workstations on test this month, the Celsius V830 is by far the most flexible in terms of future upgrades. With only 2GB PC3200 DDR memory, the Gigabyte GA-2CEWH motherboard still has six spare DIMM slots which should provide more than enough headroom for those wishing to work with large models on 64-bit Operating Systems such as Windows XP, or the forthcoming Windows Vista. The Gigabyte GA-2CEWH motherboard is also SLI capable, although the dual graphics card technology is not supported in the entry level Quadro FX 540, so you'd need to buy two brand new cards for this. You could however, buy another Quadro FX 540 to drive another monitor. There's also the option of adding a second processor, and this could become even more important as more and more CAD vendors tune their applications for multithreaded operations.

As it stands, the Celsius V830 still offers excellent performance in its single processor configuration. For some it will fall a little short in the graphics department, but this can be remedied by upgrading to one of the many Quadro FX alternatives on offer, such as the FX 1400, FX 3400 or FX 4500.

Combining this single processor performance with the flexibility of a workstation that could last you well into the future does come at a cost, but Opteron workstations are coming down in price across the board and the Celsius V830 still offers excellent value for money.

Specifications

- 2.6 GHz AMD Opteron 252
- 2GB DDR400 ECC memory
- Nvidia Quadro FX 540 128MB graphics card
- 2 x 160Gb SATA II 7,200RPM hard drives
- DVD/R/W Double Layer drive
- Integral WLAN 802.11g 54Mbps
- Windows XP Professional (SP2)
- £1,599

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Continued on page 31

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Desktop graphics	Memory	Interface	bandwidth	geometry	pixel pipelines	Dual-Screen
FireGL V5100*	128MB	256-bit	22.4GB/sec	6	12	DVI+DVI
FireGL V7100*	256MB	256-bit	28.8GB/sec	6	16	DVI+DVI

ATI FireGL WORKSTATION GRAPHICS ACCELERATORS

Easy as DELL

Continued from page 29

HP nw8240 mobile workstation

HP's previous generation mobile workstation, the nw8000, was a quality piece of kit, but lacked the finesse of some of its peers; its box-like form also made it difficult to type comfortably for extended periods. HP looks to have learnt some lessons from the nw8000, and its replacement, the nw8240 is a much more refined machine. Its chassis is more slender, the full size keyboard is a pleasure to use, and following the lead of manufacturers like Dell, the nw8240 sports an impressive 15.4 widescreen 1,920 x 1,200 resolution display.

In order to facilitate this high resolution screen the unit is noticeably larger than its predecessor with a width and depth comparable to the Dell Precision M70. However, unlike Dell's flagship mobile workstation, HP's nw8240 is extremely slender, measuring only 28mm at the front and as a result weighing in at a very respectable 2.77kg.

As is still standard in virtually all mobile workstations Intel's Pentium M takes centre stage in the nw8240. The processor, which features 2MB L2 cache, offers a serious amount of performance for CAD, which becomes even more remarkable considering how little power it draws from the battery. Our review machine featured the Pentium M 770 (2.13GHz), although HP also offers the new Pentium M 780 (2.26GHz) for those looking to maximize their processing power. Still, the Pentium M 770 is no slouch, and has enough processing power to keep up with the desktop machines on test this month.

Rather than kit out the machine with its maximum 2GB of DDR2 memory, our review machine featured a total of 1GB. Depending on your requirements for CAD on the go, this is a decent amount, but if you commonly work with large models, run a number of applications concurrently, or carry out complex analysis or rendering calculations, adding the additional 1GB will be money well spent.

Graphics-wise the machine features ATI's 128MB Mobility FireGL V5000, which provides a solid foundation for the majority of 3D CAD applications. While the 5,400RPM 80GB Serial ATA hard drive gives users ample storage space, some might find it a little slow loading up large models. Of course, HP also offers 7,200RPM drives in 60GB, 80GB, or 100GB sizes.

Elsewhere, the nw8240 features all the typical components you'd expect to find in a workstation class laptop –DVD+/-RW, Type I/II PCMCIA PC card slot, Intel Wireless LAN 802.11b/g Mini PCI card, integrated Bluetooth, NetXtreme Gigabit (10/100/1000 NIC) PCI Express Ethernet Controller, integrated Smart Card Reader, secure digital slot, three USB 2.0 and one Firewire port. There's also an impressive 16-bit sound system which has speakers nestled either side of the keyboard.

In the nw8240 HP has developed a highly impressive successor to the nw8000, not only totally reworking it in terms of form, but refining its screen to accommodate the increasingly popular widescreen format. N.B. for those that don't get on with such high resolution displays, HP also offers the option of a 15.4" WSXGA screen at 1,680 x 1,050.

Performance wise, while the nw8240 holds its own under CPU intensive operations, it is not the fastest mobile workstation out there when it comes to 3D graphics, playing second fiddle to Dell's Precision M70 and its Nvidia Quadro FX Go1400 graphics card. However, the HP does win hands down when it comes to portability and styling, and for this it demands close attention. But at the same time it's also worth keeping a watchful eye on the next generation of mobile workstations, which are likely to be out in the next few months, and based on Intel's new Core Duo processor.



Specifications

- 2.13GHz Intel Pentium M 770
- ATI Mobility FireGL V5000
- 1GB DDR2 memory (max 2GB)
- 80GB 5,400 RPM hard drive
- Mobile Intel 915PM Express Chipset
- Microsoft Windows XP Professional
- £1,589

www.hp.co.uk

Workstation	CAD2 Imagine FX3800-64	Scan 3XS	FJ Celsius V830	Dell Precision 380	HP nw8240 mobile workstation
Processor type and clock speed	3.80GHz Intel Pentium 4 670	2.2GHz AMD Opteron 148	2.6 GHz AMD Opteron 252	3.0GHz Intel Pentium 4 630	2.13GHz Intel Pentium M 770
Memory	3GB PC2-4200 533MHz Dual-Channel DDR-2	2GB DDR PC3200	2GB DDR400 ECC	1GB 533MHz DDR2 SDRAM	1GB
Graphics card	Nvidia Quadro FX 1400	Nvidia Quadro FX1400	Nvidia Quadro FX 540	ATI FireGL V3100	ATI FireGL V5000 Mobility
Graphics driver	81.67	77.18 (81.67)*	71.84 (81.67)*	8.163	8.163
Hard drive	2x Seagate Barracuda 7200.9 160GB S-ATA 300 (Raid 0)	2 x 250GB Samsung SpinPoint SATA300 (Raid 0)	2 x 160Gb SATA II 7,200RPM	80GB SATA	80GB 5,400 RPM
Price	£1,595	£1,225	£1,599	£599	£1,589

What's slowing you down?

Spyware is a malicious problem that affects us all, but with reference to his recent experiences, Rob Jamieson asks is the cure worse than the infection?

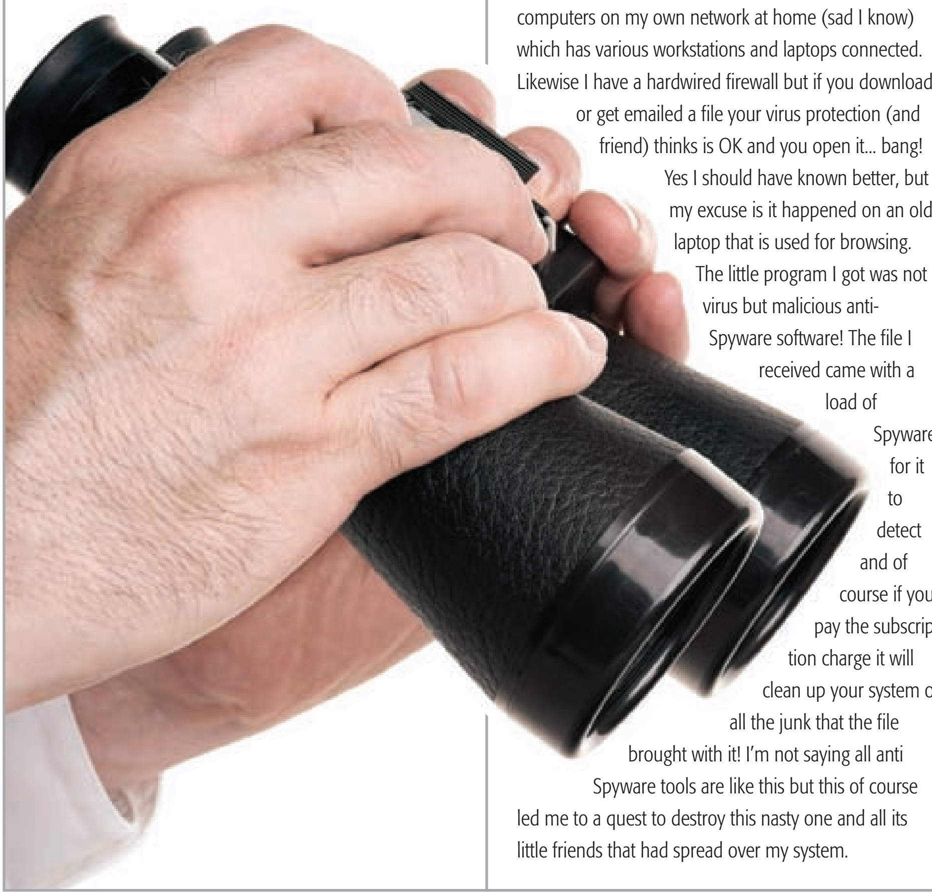
Robert Jamieson

I have often talked about different components that affect system performance, but a recent infection of Spyware highlighted to me just what else can be going on with software add-ins and how these can slow you down.

A typical workstation computer has the main design application and other standard office applications, such as word processor and mail, and most have access to the Web for information. However, this can also result in access to lots of nasty Spyware, as well as viruses they can bring with them. But is the cure worse than the infection?

Everybody knows about viruses and everybody should have some form of updated anti-virus software installed. Windows XP SP2 will warn you if you don't have one installed unless somebody or something has modified your registry to stop it showing this! The problem is that that until recently Spyware has not been treated as such a malicious problem. A lot of "nice" websites have used Spyware to find out how many times you visit their site or their competitor's sites etc.

Cookies are one way Spyware manifests itself. These then transmit messages back to the originator's site with details such as your habits of browsing etc.



You might say "what is the problem with this?" Well the answer is the constant communication is slowing you down. You also might say "but I only use my workstation for designing", but the thing is a lot of CAD programs use web browsers to provide libraries and help etc. so you have no choice but to use a browser. Not all Spyware lives in cookies, so just deleting cookies in the "Temporary Internet files" will not kill them all.

Beyond cookies

Some Spyware hides in other DLLs (Dynamic Link Library) or other executable .exe files. This is bad as they can run all the time your workstation is on sending information to other people about your habits, passwords, bank details etc. Now you would think your anti-virus would stop this. The thing is Spyware is not a virus so they don't all detect them. The other way Spyware can get on your system is through a 'vulnerability', i.e. a hole in a program or process where a file can be planted on your system.

Microsoft has woken up to this and is allowing a free download of Microsoft Windows AntiSpyware program which I had a recent reason to use in anger. Like most corporate users we have an IT infrastructure to protect me which it does most of the time but I also have a lot computers on my own network at home (sad I know) which has various workstations and laptops connected. Likewise I have a hardwired firewall but if you download or get emailed a file your virus protection (and friend) thinks is OK and you open it... bang! Yes I should have known better, but my excuse is it happened on an old laptop that is used for browsing. The little program I got was not a virus but malicious anti-Spyware software! The file I received came with a load of Spyware for it to detect and of course if you pay the subscription charge it will clean up your system of all the junk that the file brought with it! I'm not saying all anti Spyware tools are like this but this of course led me to a quest to destroy this nasty one and all its little friends that had spread over my system.

Curing the infection

I will not detail everything in my voyage of discovery but I think the process is interesting, just in case you should encounter a similar problem. The first thing I did was disconnect the system from the network to stop it spreading its files to other systems. I have shares for picture stores and remote printers and I didn't want to take any chances with them also getting infected. I downloaded a bunch of tools, such as 'ewido antimalware', 'Spybot search', 'Hijack This' and 'killbox' and some others. These are serous tools so be very careful!

After running the Spyware searching tools that delete the dangerous files all was not well. I still had processes running that I didn't recognise, like netmone.exe etc. After trying to delete a few files, re-running the Anti-Spyware software and restarting the laptop it was clear that running programs were copying themselves at Windows startup before they could be removed by the Anti-Spyware. The files themselves could not be deleted as the files were in use and Windows wouldn't allow it! So now to Plan C. 'Windows Msconfig' and 'Hijack This' can show you what files are being executed on startup and stop them. 'Killbox' sets files to be deleted before they start a process so they can't copy themselves at startup. I did this to the files I suspected and re-run the Anti-Spyware and I thought all was well.

But I just didn't trust that I had destroyed all the files. So I ran some executable files and the Spyware clicked in saying I had a new infection. The point is I couldn't have as I still had not connected to the web so the infection was already there! Now if you had purchased the Anti-Spyware you would think it was doing its job but in reality it hadn't cleaned up the previous infection. The way I managed to stop this was I searched for all the new files created on the system that day and added them to killbox and repeated Plan C. This is because the Spyware wasn't clever enough to change the file dates.

One of my friends suggested it would have been easier to delete the OS (Operating System) and start again but I learnt a lot about Windows startup and was able to apply my new set of skills to another laptop and take out all the guff that builds up, like SQL databases etc which I no longer use. This in fact reduced the startup time by 1min 15 seconds and after a full defragment (including swap space) it felt a lot faster (the main user, my wife confirmed this).

Lessons learnt

My point is never trust anything, the cure is not always a true cure. Having had the experience I had I'm now not prepared to take the risk of not having a good resident in memory Anti-Spyware programme monitoring my system all the time but of course this has slowed the laptop down a bit. It's worth trying Windows AntiSpyware Beta1 (whilst it's free) just to see how clean your system is.

Robert Jamieson works for workstation graphics specialist, ATI.

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HD ready?

There is a lot of information about HD floating around as broadcasters start to gear up for transmission, but will this high resolution TV standard affect CAD in any way, asks ATI's Robert Jamieson.

Robert Jamieson



First off, what is HD? High Definition is a term used to say that the television or screen can support a minimum of 720 physical horizontal lines and widescreen. Now, I hear you say even the 1,024x 768 monitor resolution has more lines than this. Yes this is true, but this is the basic requirement to attain the "HD ready" logo, there are actually a number of higher resolution modes that are a lot more useful to us. Manufacturers also have to pay a license fee to EICTA before they can use the logo.

Before the "HD ready" logo a lot of manufactures stated their screens could take a HD input but the high-resolution image was then scaled down to fit into an 800 x 600 display, for example. This would result in an effective 450 lines, which isn't exactly HD is it? A salesman in a specialist reseller was telling me his complete range was 1080p ready today just because it had this logo - not true. Devices might upscale to fill the screen but native resolution is where the quality is.

So what are the resolutions? The typical standard HD called 720p is 1,280 x 720 pixels. The top standard is 1,920 x 1,080 (1080i and 1080p). The i and the p are Interlaced and progressive scan. Interlaced is where one line is refreshed one cycle and the next line the next cycle. Progressive are refreshed each cycle, and is therefore better quality. A screen at the top resolution is interesting, but why? 1,920 is higher than most standard monitors today and because it's widescreen you get a nice place to put all those CAD menus on the side.

The other advantage to these high resolution screens is that they need fast refresh rates (8ms or less) so fast motion of a movie is rendered correctly. This is also quite useful for rotation of 3D objects in CAD. You might say that we already have high resolution screens but the quantities of scale of production will help the price and availability to take it out of a specialist area.

Of course all this talk of HD has pushed the camera manufactures and effects people to re-equip. HD cameras are widely available and coming down in price, but creating and editing the HD media results in a lot more information and more detailed model creation because you see everything on the screen. All this work in rendering high quality 3D will bleed off into 3D CAD eventually as well.



How do we connect to one of these screens? DVI-I (Digital Video Interface-integrated) on all current workstation cards should support up to this resolution. DVI-D is the digital only version on some older cards. A physically smaller domestic standard is HDMI (High Definition Multimedia Interface) which can carry audio as well as digital signals. This is becoming popular now but you can get DVI to HDMI converters. HDCP (High-bandwidth Digital Content Protection) is built in to HDMI to protect the copying of the media, but that needs an entire article just to discus the ethics of it.

> HD denotes that the television or screen can support a minimum of 720 physical horizontal lines and widescreen

Hardware video decoding

What is H.264 the new HD hardware video decoder? H.264 is a new video compression scheme that is becoming the worldwide digital video standard for consumer electronics and personal computers etc.

H.264 has already been selected as a key compression scheme (codec) for the next generation of optical disc formats, HD-DVD and Blu-ray disc (sometimes referred to as BD or BD-ROM). H.264 has been adopted by the motion Picture Experts Group (MPEG) to be a key video compression scheme in the MPEG-4 format for digital media exchange. H.264 is sometimes referred to as "MPEG-4 Part 10" (part of the MPEG-4 specification), or as "AVC" (MPEG-4's Advanced Video Coding). If you are going to want to output high quality 3D walkthroughs etc this is a codec worth looking at in the future to get the maximum resolution and speed.

ATI's market brand to do this is called Avivo and Avivo-enabled VPUs and accompanying software work together to permit transcoding of video signals. Transcoding is the process of re-encoding video in a format (or simply at a bit rate) different from its original. Transcoding capability is becoming extremely important at a time when there is an explosion of video-capable devices (PDAs, cell phones, portable game consoles, etc) that have widely-varying capabilities in terms of the formats they support and the amount of storage they take. Now you might say what's this got to do with CAD? At the first look not a lot but as it's 4x faster than any current CPU, transcoding it shows what sort of information processing can be done on the GPU or video card. This sort of processing can be applied to other areas and CAD is a graphics-based application!

<< Avivo-enabled graphics cards such as ATI's X1800 combine with software running on the computer to allow the re-encoding of HD video 4x faster than any current mainstream CPU.

On sale now

Can you buy anything now? Yes and No. to get the ultra high resolutions of HD you need to spend a lot of money. I often get asked about what is best between CRTs, LCDs and Plasmas. A lot of companies need a large screen in the reception to show what they do to prospect customers etc. My buying experience in high street showrooms is that they feed very low signal or highly encoded with loads of artefacts so you can't see the real quality the screen can support. CRTs are just too physically big today, plasmas only really support the 720p or resolutions like 1,024 x 768 as a maximum without spending silly money, whereas LCD HD can support 1080i and p just make sure you supply a high quality signal. Some of the top Sharp models look very good.

To sit at your desk with a 32inch screen is unlikely today, but you can already get very high resolution screens in laptops like the HP nw8240, but once this at reasonable prices and I'm sure the software companies will make use of the extra real-estate!

Robert Jamieson works for workstation graphics specialist, ATI.

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